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# Environmental Analysis I

93-19456



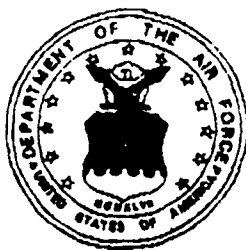
FINAL 1983

ENVIRONMENTAL IMPACT STATEMENT  
SUPERSONIC FLIGHT OPERATIONS  
IN THE VALENTINE MILITARY  
OPERATIONS AREA

HOLLOMAN AFB, NEW MEXICO

DEPARTMENT OF THE AIR FORCE  
TACTICAL AIR COMMAND

03 8 20 034



**Air Force  
Environmental Planning Division  
(HQ USAF/CEVP)**

Room 5B269  
1260 Air Force Pentagon  
Washington, DC 20330-1260

16 JUL 93

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*(ATTN: Pat Mauby)*

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*Jack Bush, Gm-14*  
MR. Jack Bush  
Special Projects and Plans  
703-697-2928  
DSN 227-2928

# COVER SHEET

- (a) Responsible Agency: United States Air Force.
- (b) Proposed Action: Supersonic Flight Operations in the Valentine Military Operations Area in Hudspeth, Culberson, Jeff Davis, and Presidio Counties, Texas.
- (c) Responsible Individual: Alton Chavis, HQ TAC/DEEV, Langley AFB, VA 23665; Telephone (804) 764-4430.
- (d) Designation: Final Environmental Impact Statement (FEIS).
- (e) Abstract: The 49th Tactical Fighter Wing (TFW) at Holloman AFB, New Mexico, proposes to fly approximately 300 supersonic sorties per month in the Valentine Military Operations Area/Air Traffic Control Assigned Airspace area. All proposed supersonic flights would be conducted during daylight hours and at an altitude above 15,000 feet mean sea level which is 8,000 to 10,000 feet above ground level in the MOA.

Several alternatives were reviewed including the "no action" option. A review of existing MOA's within 150 NM of Holloman AFB show the more viable alternatives to be: utilize only the White Sands Missile Range (WSMR) and the Reserve MOA; use only the WSMR and the Valentine MOA. The Air Force's preferred alternative is to conduct 300 sorties per month in both MOA's (Valentine and Reserve) to minimize the number of sonic booms each area would receive.

The primary environmental concern associated with the proposed action is the effects of sonic booms. It is projected an individual would hear no more than 2 to 3 sonic booms per day in the area of flight operations. Over-pressure levels would range from 1 to about 5 psf with the average carpet boom being 2 to 3 psf. Focus booms could occur in the area. Concerns have been raised about significant indirect impacts to the economy by sonic booms impacting ranching operations and recreational activities. Other concerns raised were wildlife, human health and annoyance, structures, cultural resources, and commercial/private air traffic impacts. Each attribute has been analyzed to a depth sufficient to determine if the potential impact would be significant. No significant impacts were identified on socio-economics or health effects. The potential long term health effects of loud noise is a debatable issue. Some researchers believe there is a link between noise and ill-health; however, this is contrary to the consensus of the scientific community at this time.

(f) DATE MADE AVAILABLE TO PUBLIC:

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## SUMMARY

DRAFT ( ) FINAL (X) ENVIRONMENTAL IMPACT STATEMENT

1. Type of Action: Administrative (X) Legislative ( )

2. Brief Description of Air Force Proposed Action:

The 49th Tactical Fighter Wing (TFW) at Holloman AFB, New Mexico, proposed to fly approximately 300 supersonic sorties per month in the Valentine Military Operating Area/Air Traffic Control Assigned Airspace Area (MOA/ATCAAA). Although variations are possible, typically three or four aircraft would fly together in the area for half an hour four or five times a day. Only a small portion of that time would be at supersonic speeds. All proposed supersonic flights would be conducted during daylight hours on weekdays and at an altitude above 15,000 feet Mean Sea Level (MSL) which is 8,000 to 10,000 feet above ground level in the MOA. The Valentine MOA is located in the Trans Pecos region of Southwestern Texas and covers portions of Culberson, Hudspeth, Jeff Davis, and Presidio counties.

3. Public Review of the Revised Draft EIS:

The public review and comment period for the revised draft environmental impact statement (RDEIS) began on August 5, 1983, with publication of the Notice of Availability in the Federal Register, and ended on November 4, 1983. During this three month review period, public comments on the RDEIS were solicited. Written comments were submitted to Headquarters Tactical Air Command at Langley Air Force Base, Virginia. Verbal comments were received at the public hearing held in Valentine, Texas, on October 11, 1983.

The Air Force's response to these comments consists of individual responses to the comments and questions. In addition, an errata sheet provides factual corrections to the RDEIS. Since changes in response to the comments are minor, the final EIS will consist of the RDEIS, the comments, the responses, the errata sheet, and this Summary. This Summary is similar to the one in the RDEIS, but it has been revised slightly in order to reflect the public comment process.

4. Summary of Environmental Impacts:

The environmental impacts associated with the proposed action are a result of the aircraft flying greater than the speed of sound. Currently, the Valentine MOA is used by the 49th TFW for F-15 training at subsonic speeds. The additional environmental impacts would be increased air pollutants and sonic booms.

There would be an increase in air pollutants due to accelerating to supersonic speeds; however, the increase would be small because the amount of time the aircraft would be supersonic is about one-half minute per sortie and is about two percent of the time currently spent in the MOA. The pollutants would be emitted at a relatively high altitude and spread over a large area; consequently, the impact on local ambient air quality would be minor.

The primary impact of concern for local residents is the effects of sonic booms on people, domestic animals and wildlife, archaeological sites, structures, and local economics. The Air Force has conducted an intensive literature review, conducted special tests and developed a sonic boom model to assess the magnitude of impacts to the various environmental attributes.

The sonic boom model<sup>94</sup> prepared from analysis of similar F-15 operations in the Oceana MOA (W-72 off the coast of North Carolina) indicate the average duration of a supersonic event was about 15 seconds. The number of supersonic events per sortie averaged 2.7 with thirty percent of these producing a sonic boom that would hit the ground, or 0.8 booms per sortie. The study also shows the average airspeed and altitude were about 1.1 Mach and 15,100 feet, respectively. The average carpet boom (the boom pattern produced by straight, level flight) would impact about 28 square miles. Supersonic flight operations occur within an elliptical area of about 170 square miles. Statistical analysis of the Oceana data indicates the average carpet boom range between two to three pounds overpressure per square foot. (Greater than eleven pounds per square foot are generally required to cause structural damage.) The probability of a six pound per square foot boom occurring is about one in 20,000 chances. The chance of hearing four or more booms per day is less than one percent; on average any one person should not hear more than two to three booms per day. Since Air Force pilots will avoid the city of Valentine by at least five miles, booms are not expected to be heard at that location. For similar reasons, booms are not expected to be heard outside of the Valentine MOA. On rare occasions, however, it is possible for a boom to be heard where it is not expected.

Maneuvering operations such as longitudinal accelerations, pushovers, and turns can cause focusing of the sonic wave at a fixed location. As indicated, these focus booms impact at a small, fixed area and do not follow the aircraft flight tract. The pressure increase can vary from two to five<sup>78,98</sup> times the overpressure level of the carpet boom at the location of focus; however, atmospheric conditions reduce the possibility of such increase to two to four times. Often atmospheric turbulence will cause a de-focusing effect that dissipates the boom completely.<sup>99</sup> A most important point about focus boom is that the peak pressure decays much more rapidly than that of a carpet boom and, thus, the positive impulse is much lower (contains less energy) than a carpet boom of the same overpressure. Galloway<sup>99</sup> has provided generalized algorithms for evaluating the spatial effects of focus booms. Statistical analysis of the data shows the chance of any one location receiving a focus boom from a linear acceleration and pushover maneuvers is one in about 3,300 and for a turn maneuver the probability is one in 5,000 chances. The probability of a focus boom is one in about 16,700 chances. Daley<sup>105</sup> has also investigated the spatial effect of a focus boom by using the National Oceanic and Atmospheric Administrations' Splash sonic boom model. The model showed that the focus zone exceeding nominal carpet was a band about 16 feet wide parallel to the curved flight track. At the point where the overpressure is twice the nominal carpet, the width reduces to about three feet. Applying this data to Valentine would show the probability of a focus boom impacting any one spot where the overpressure is equal to nominal carpet to be about one chance in 8,500; for overpressures two times or more greater than nominal, the probability reduces to one in 42,500 chances. Thus it can be seen that for higher magnification factors, the spatial effect and probability of the boom hitting any given location gets extremely small.

There are three categories of concern in terms of sonic boom impact to people: potential for hearing loss, non-auditory ill-health and annoyance. The long term day-night "C" weighted noise level associated with the maneuvering ellipse indicates a spatial average of 58 decibels. From an energy average standpoint, a focus or superbomb adds less than 0.01 decibels to these values and consequently is not significant in terms of day-night average noise levels. This data, along with the fact that tests conducted where the overpressures range between 50 to 144 psf did not show any permanent hearing loss, leads the Air Force to the conclusion that booms in the range anticipated at the Valentine MOA would not cause any hearing loss, either from routine operations or from a focus boom.

Annoyance factors suggested by CHABA<sup>107</sup> coupled with EPA<sup>100</sup> and HUD<sup>93</sup> recommended noise level guidelines indicated that about six out of about 850 people in the Valentine MOA will be highly annoyed. The day-night average noise levels would be compatible with HUD criteria for a residential environment.

No definitive stance on physiological ill-health can be made at this time. There is little doubt that noise, including sonic booms, acts as a stressor, but it is not known with any degree of certainty whether prolonged exposure results in cumulative pathology. Some research has been conducted to determine the link between noise and ill-health; however, many of these studies are questioned by the scientific community. CHABA<sup>95</sup> was requested by OSHA and EPA to consider research that might be performed to examine the effects on human health from long-term noise exposure for industrial workers and the general population, respectively. CHABA's conclusion was that auditory effects were fairly well defined; however, in light of the data reviewed on non-auditory effects it would be prudent to obtain more critical research. While these considerations are primarily for general audible and industrial impact noises, it is stressed that specific data on sonic booms is also needed. EPA<sup>92</sup> indicates that due to the frequency range of sonic booms they may not be as harmful as other higher frequency impact sounds.

Researchers like Kryter<sup>55</sup> and Broadbent<sup>11</sup> indicate that if ill-health can result from noise, the connection probably is due to psychological stress factors. If this is the connection and if one accepts the social surveys that predict annoyance as a factor of noise levels, then one would conclude that a very low percent, if any, of the exposed people in the Valentine MOA would develop non-auditory ill-health conditions.

Public commenters urged the Air Force to provide a "worst-case" analysis of potential health impacts caused by sonic booms. However, specific predictions of such impacts are not possible. Additional years of research are needed to scientifically determine causal connections or to realistically predict generalized health effects based upon noise. Nevertheless, it has been suggested that there are links between noise and problems such as hypertension, cardiovascular changes, increased neurologic and gastrointestinal disturbances, changes in the course of pregnancy, and changes in hormone levels and other chemical balances. These effects are exemplary of conditions associated with stress. While such effects have been suggested, no method is available to predict either any specific reaction or the proportion of the community which could be affected. Although such effects cannot be dismissed, prevailing scientific opinion supports the expectation that the predicted noise exposure would not cause the effects speculated on above.

It is recognized that future research may provide a better understanding of the relationship between noise and non-auditory ill-health; however, in the interim decisions must be based on that data supported by the scientific community.

Sonic boom effects on domestic animals and wildlife have also been evaluated. Species of special concern in the Valentine area are the Peregrine falcon (endangered), sheep, horses and beef cattle. Review of available literature, information obtained on species response to sonic booms in other areas and special studies conducted for coordination under the Endangered Species Act indicate supersonic flight in the Valentine MOA will not significantly impact domestic animals or wildlife in the area. The FWS has concluded the proposed action will not jeopardize the continued existence of the Peregrine falcon.

Bighorn sheep on the Luke and Nellis AF Ranges have been exposed to sonic booms for a number of years. No noticeable effects in the population age structure, longevity or reproduction success has been found for the sheep on the Nellis Air Force Range.<sup>61</sup>

Domestic animals such as cattle, horses, sheep and poultry show very little behavioral effect from exposure to sonic booms.<sup>21,35,48,66,103</sup> Available literature and special studies reviewed support the fact that animals and wildlife can and do flourish in the presence of military aircraft operations, both subsonic and supersonic. Fletcher<sup>35</sup> concludes if aircraft noise were an adverse impact areas around large airports would be devoid of wildlife. This is also true for military operating areas and it should be noted that noise levels in MOAs are normally less than that at busy commercial airports and military airfields with jet activity.

The Air Force, in conjunction with the Texas Historic Preservation Commission and the Texas Bureau of Economic Geology, conducted a test to evaluate the significance of supersonic flight on archaeological sites within the Valentine MOA. The test did not indicate that a significant impact would occur.

Probable damage to structures should be limited and would primarily involve claims for window breakage. At the anticipated overpressure levels, the probability of glass breakage is about two-tenths of one percent. NASA's review of structural responses indicated overpressures less than about 11 pounds per square foot should not cause damage.<sup>19</sup> A 1977 evaluation on an adobe house in Southern Arizona indicated the structure reacted similarly to conventional style structures. Therefore, other than window breakage, structural damage may be limited to the probability that the one in 16,700 super booms could have an associated focus region where the focused portion would hit a structure. Due to the sparcity of structures in the area, the chance of a structure being hit by such a boom is limited; however, it is possible.

Possible impact to archaeological sites in the Valentine MOA was evaluated in July 1981 and the study concludes that sonic booms are unlikely to cause any significant damage. As a worst case scenario, it was concluded that a sonic boom might trigger the spalling of surface rock layers which are already in an unstable state due to natural erosive mechanisms; however, in this case, the natural processes would be expected to complete the spalling process over

a short time. The expected ground motions are, at worst, eight percent of the limits set by strict blasting codes and compare to velocities which could be produced by local earthquakes that occur in the Valentine area. At all sites visited during the study, rocks appeared to be sufficiently competent to withstand the acoustic and seismic waves generated by sonic booms.

The potential for sonic boom impact in the local economy has been evaluated and determined not to be significant. The evaluation included a review of population, employment, personal income, retail trade, assessed valuation, real estate development, tourism, ranching, farming, mining, and forestry. In no case did any of the areas' economic attributes indicate sonic booms would result in a significant impact.

In conclusion, the Air Force does not foresee significant impacts to human health, the local economy, or the other topics investigated, such as endangered species. As reflected by the public comments, however, the local populace clearly anticipates significant impacts to such factors as their quiet, rural lifestyle; the local economy; and their health. Many commenters opposed the proposal, criticized the Air Force's analysis, or both. Due to the subjective nature of individual responses to noise, active campaigns against a proposed flight program will frequently generate multiple anticipatory complaints far in excess of those occurring during the actual program. Nevertheless, a small number of people would be anticipated to remain "highly annoyed" after operations commenced. Because the booms themselves cannot be mitigated further, commenters emphasized the exploration and consideration of alternatives, such as alternate areas or reliance on weekend flying.

#### 5. Alternatives Considered:

In addition to the no action alternative, other options considered feasible were: use only the White Sands Missile Range and Reserve MOA, and use only the White Sands Missile Range and Valentine MOA. Use of other locations within 150NM of Holloman AFB is not practical because other operations would be disrupted. Airspace locations greater than 150NM from Holloman AFB would result in excessive cost and are not considered viable alternatives.

NOTE: The proposed supersonic training area was initially designated as the Van Horn Military Operations Area because of the proximity of the area to the town of Van Horn. Following the 3 August 1978 Valentine town meeting, several area residents requested the name of the Van Horn MOA be changed to the Valentine MOA. Basis for the request was that the town of Van Horn was outside the area boundary. The 49th Tactical Fighter Wing submitted a request for the name change and effective 19 April 1979, the Van Horn area was redesignated as the Valentine Military Operations Area. Although all references to the Van Horn area in the text have been changed to reflect the recent name change, no attempt was made to change the appendices. Consider all references to the Van Horn MOA in the appendices as being synonymous with the present Valentine MOA.

PUBLIC  
COMMENTS

RONALD D. COLEMAN  
16TH DISTRICT, TEXAS

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PECOS, TEXAS 79772  
(815) 445-8218



**Congress of the United States**  
**House of Representatives**  
**Washington, D.C. 20515**

November 1, 1983

HQ TAC/DEEV  
ATTN: Mr. Alton Chavis  
Langley AFB, Virginia 23665

RE: Revised Draft Environmental  
Impact Statement, Supersonic  
Flight Operations in the  
Valentine Military Operation  
Area

Dear Mr. Chavis:

I very much appreciate the opportunity to comment on the evaluation of the potential impact of supersonic flight operations in the Valentine Military Operations Area (MOA) as described in the Revised Draft Environmental Impact Statement of July 27, 1983. I would also like to commend the Department of the Air Force for keeping me informed on this important matter and for its decision to delay the public hearing planned for September 12, 1983 to October 10, 1983 and to extend the written comment period at my request. This permitted my constituents to carefully peruse the statement in anticipation of the hearing and to prepare comments. I am enclosing a copy of my letter to the Air Force Legislative Liaison Office for inclusion in the record.

As a member of the House Armed Services Committee, I am certainly cognizant of the need to conduct supersonic flight operations because of their intrinsic combat training value. The 49th Tactical Fighter Wing at Holloman Air Force Base serves an important function in the United States defense posture and is a source of pride for many in the desert southwest. In a similar fashion, I am ever mindful of the health and safety of the people in my congressional district whose needs and views are of paramount importance. It is this context in which I reviewed the Draft Environmental Impact Statement.

Concerns expressed by my constituents in meetings, correspondence and telephone calls to my office echo those raised at the first public hearing on this issue in 1979 and contained in the transcript of that hearing. The most notable of these concerns include health issues related to humans and animals, potential damage to fragile archeological sites, night flights, out-of-boundary flights, and problems connected with damage to homes and buildings, such as delayed compensation and under valuation of damage estimates.

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ARMED SERVICES COMMITTEE

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AND DEVELOPMENT

SUBCOMMITTEE ON MILITARY  
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COMMERCE, CONSUMER, AND MONETARY  
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GOVERNMENT ACTIVITIES AND  
TRANSPORTATION SUBCOMMITTEE

GOVERNMENT INFORMATION, JUSTICE, AND  
AGRICULTURE SUBCOMMITTEE

MAJORITY WHIP AT LARGE

HQ TAC/DEEV  
Mr. Alton Chavis  
November 1, 1983  
Page 2

1 I am most concerned about the potential adverse effects on the health of my constituents caused by prolonged exposure to noise caused by supersonic flights. The draft statement concludes in its summary that "no definitive stance on physiological ill-health can be made at this time. There is little doubt that noise including sonic booms acts as a stressor, but it is not known with any degree of certainty whether prolonged exposure results in cumulative pathology." This notion of placing people in a situation without definite knowledge of its harmful effects is unconscionable.

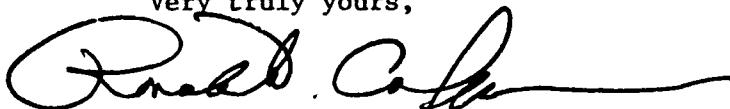
2 Dr. Richard Worthington of the Department of Biological Sciences at the University of Texas at El Paso, who has followed this issue with great interest, informs me of the great volume of literature which concludes that noise adversely affects people, and he has presented this information to the Air Force. He specifically points out that noise stress will cause health problems such as hypertension, ulcers, and problems with pregnancy. In addition I would submit that the suggestion in the draft statement summary that "about six out of almost 700 people in the Valentine MOA will be highly annoyed" by the noise falls far below those affected based on the inquiries I have received.

3 Another issue of major concern to me is future use of the Valentine MOA should the present proposal be implemented. The language on pages 1-5 and 1-13 of the Draft Statement alludes to the fact that it is difficult to ascertain the increased usage of airspace over White Sands Missile Range, for example, which would in turn require additional supersonic sorties over other designated areas. It is unreasonable to entertain thoughts of accepting the Air Force's proposal at this time in light of unforeseen circumstances at White Sands, the Reserve, New Mexico MOA, or other military facilities in the region which might increase airspace usage over the Valentine MOA.

4 In reconciling the need to provide for combat aircrew readiness and responding to the concerns of my constituents, I would suggest continued negotiations with the Department of the Army for use of its test facility at White Sands Missile Range. In this regard, I would offer any assistance I may be able to provide as a member of the Armed Services Committee. In the alternative, I would direct efforts to locate public lands in the region suitable for the sorties.

With kindest personal regards, I remain

Very truly yours,



Ronald D. Coleman  
Member of Congress

RDC:jls



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16TH DISTRICT, TEXAS

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**Congress of the United States**  
**House of Representatives**  
**Washington, D.C. 20515**

**COMMITTEES:**

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**MAJORITY WHIP AT LARGE**

August 22, 1983

Albert L. Barbero  
Colonel, United States Air Force  
Chief, Program Liaison Division  
Office of Legislative Liaison  
Washington, D.C. 20330

Dear Colonel Barbero:

Thank you for your letter of July 27, 1983 informing me of the proposed supersonic flight operations in the Reserve, New Mexico and Valentine, Texas Military Operations Areas. You stated that the Air Force intends to receive public comments at hearings in each area and my understanding is that one is scheduled in Valentine on or about September 12. Pursuant to a telephone conversation you had with my Legislative Assistant, Jose Sanchez, on this date, I would like your assistance in delaying both the deadline for public comments on the Draft Environmental Impact Statement and the date for the public hearing in Valentine.

I can certainly appreciate the fact that these hearings have been under consideration for some period now. The additional time, however, will permit my constituents directly affected by the operations to prepare their responses to the revised Draft Environmental Impact Statement. Other interested parties who have been following the development of these flight operations have expressed an interest in delaying these hearings and public comment period.

At your invitation, I intend to send a representative from my Congressional office to attend the Valentine hearing.

Thanking you in advance for your cooperation in this matter and with kindest personal regards, I remain

Very truly yours,

Ronald D. Coleman  
Member of Congress

RDC:jls



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VI

INTERFIRST TWO BUILDING, 1201 ELM STREET  
DALLAS, TEXAS 75270

SEP 15 1985

John O. Rittenhouse  
Deputy for Installations Management  
Office of the Assistant Secretary  
Department of the Air Force  
Washington, D.C. 20330

Dear Mr. Rittenhouse:

We have completed our review of the Revised Draft Environmental Impact Statement (EIS) on the proposed Supersonic Flight Operations in the Valentine Military Operations Area (MOA) which is located in the extreme portion of southwestern Texas next to Mexico.

The Draft EIS examines the impacts associated with 300 to 600 proposed supersonic training flights each month by F-15 aircraft stationed at Holloman AFB, New Mexico. The principal impacts associated with the proposed training are related to as many as 24 sonic booms generated each day by aircraft maneuvering above 15,000 feet mean sea level in the MOA.

The following comment is offered for your consideration:

5      Considering the many concerns expressed by area citizens and included in the Draft EIS as well as the close proximity of the nation of Mexico to the project action, we suggest that the Air Force consider mitigation further. The potential adverse impact that frequent sonic booms would have on human and wildlife populations in the Valentine MOA could be reduced by flying some of these supersonic missions at Sells MOA and some overwater, as discussed in the EIS. Flying these missions at Sells MOA would require aerial refueling, but since each pilot must maintain refueling proficiency, multiple training requirements could be satisfied on a single mission.

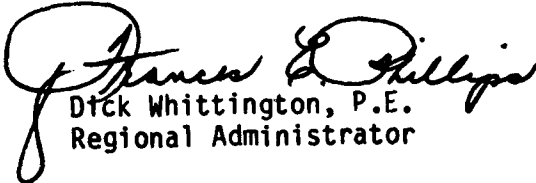
We classify your Revised Draft EIS as LO-1. Specifically, we have no objections to the project as described in the Statement; however, we request that mitigation be considered further and offer suggestions. Our classification will be published in the Federal Register according to our responsibility to inform the public of our views on proposed Federal actions, under Section 309 of the Clean Air Act.

-2-

Definitions of the categories are provided on the enclosure. Our procedure is to categorize the EIS on both the environmental consequences of the proposed action and on the adequacy of the EIS at the draft stage, whenever possible.

We appreciate the opportunity to review the Draft EIS. Please send our office five (5) copies of the Final EIS at the same time it is sent to the Office of Federal Activities, U.S. Environmental Protection Agency, Washington, D.C.

Sincerely yours,

  
Dick Whittington, P.E.  
Regional Administrator

Enclosure

## ENVIRONMENTAL IMPACT OF THE ACTION

### LO - Lack of Objections

EPA has no objections to the proposed action as described in the draft impact statement; or suggests only minor changes in the proposed action.

### ER - Environmental Reservations

EPA has reservations concerning the environmental effects of certain aspects of the proposed action. EPA believes that further study of suggested alternatives or modifications is required and has asked the originating Federal agency to re-assess these aspects.

### EU - Environmentally Unsatisfactory

EPA believes that the proposed action is unsatisfactory because of its potentially harmful effect on the environment. Furthermore, the Agency believes that the potential safeguards which might be utilized may not adequately protect the environment from hazards arising from this action. The Agency recommends that alternatives to the action be analyzed further (including the possibility of no action at all).

## ADEQUACY OF THE IMPACT STATEMENT

### Category 1 - Adequate

The draft impact statement adequately sets forth the environmental impact of the proposed project or action as well as alternatives reasonably available to the project or action.

### Category 2 - Insufficient Information

EPA believes the draft impact statement does not contain sufficient information to assess fully the environmental impact of the proposed project or action. However, from the information submitted, the Agency is able to make a preliminary determination of the impact on the environment. EPA has requested that the originator provide the information that was not included in the draft statement.

### Category 3 - Inadequate

EPA believes that the draft impact statement does not adequately assess the environmental impact of the proposed project or action, or that the statement inadequately analyzes reasonably available alternatives. The Agency has requested more information and analysis concerning the potential environmental hazards and has asked that substantial revision be made to the impact statement. If a draft statement is assigned a Category 3, no rating will be made of the project or action, since a basis does not generally exist on which to make a determination.

DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION

SOUTHWEST REGION  
P. O. BOX 1689  
FORT WORTH, TEXAS 76101



DATE: August 25, 1983

IN REPLY  
REFER TO: ASW-43A

SUBJECT: Environmental Impact Statement - Supersonic Flight Operations in the  
Valentine Military Operations Area, Holloman AFB, New Mexico

FROM: Manager, Budget and Planning Branch, ASW-43

TO: Headquarters Tactical Air Command/DEEV  
Langley AFB, VA 23665

We appreciate the opportunity to comment on the subject environmental impact statement. It has been reviewed and we find that it will have no adverse impact on FAA facilities now installed or planned.

  
E. B. McCoy



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control  
Atlanta GA 30333  
(404) 452-4257  
September 24, 1983

Headquarters Tactical Air Command/DEEV  
Attention: Mr. Alton Chavis  
Langley Air Force Base, Virginia 23665

Gentlemen:

Thank you for sending us a copy of the Revised Draft Environmental Impact Statement (EIS) for the Supersonic Flight Operations in the Valentine Military Operations Area, Holloman Air Force Base, New Mexico. We have reviewed your responses to our September 11, 1979, comments and find our comments to be satisfactorily addressed.

We understand that the Air Force will consider all aspects of the public controversy concerning the proposed action and will make every reasonable effort to mitigate the effects of the increased noise levels upon human health and welfare. These measures are described on page 9-4 of the EIS. We note that the Air Force "... experience and scientific evidence do not indicate significant impact will occur as a result of the proposed action."

We appreciate the opportunity to review the Revised Draft EIS. Please send us one copy of the Final EIS when it becomes available.

Sincerely yours,

Frank S. Lisella, Ph.D.  
Chief, Environmental Affairs Group  
Environmental Health Services Division  
Center for Environmental Health



# United States Department of the Interior

OFFICE OF THE SECRETARY  
Office of Environmental Project Review  
Post Office Box 2088  
ALBUQUERQUE, NEW MEXICO 87103

ER-83/964

SEP 19 1983

Mr. Alton Chavis  
Headquarters Tactical Air Command/DEEV  
Langley Air Force Base, Virginia 23665

Dear Mr. Chavis:

This responds to your request for the Department of the Interior's comments on the Revised Draft Environmental Statement for Supersonic Flight Operations for Valentine Military Operations Area, Culberson, Hudspeth, Jeff Davis, and Presidio Counties, Texas.

## FISH AND WILDLIFE RESOURCES

6 Studies on sensitive wildlife species such as peregrine falcons and bighorn sheep indicate these species are relatively unaffected by sonic booms. They may be momentarily startled by the booms but have been observed to resume their activities within a few seconds following a boom occurrence. We are  
6 unaware of data on the effects of sonic booms, if any, on wildlife which are exposed over continued periods of time or of the effects on very young animals.

7 We would recommend that concentrations of migratory waterfowl be avoided. Known areas of deer and antelope populations should also be avoided in the  
7 spring months to reduce disturbances and lower stress on the females during fawning and kidding (giving birth).

8 Concerns have been raised over the effects of sonic booms on water storage tanks. If there are no other sources of water available in this arid climate, it can be assumed that wildlife, in addition to livestock, will depend on these tanks for water. If sonic booms crack or otherwise damage these tanks and  
8 the water leaks out, there could be an adverse impact on wildlife species. If it appears that numerous tanks could be impacted by sonic booms, consideration should be given to reenforcing or bringing these tanks up to standard before initiating supersonic flights.

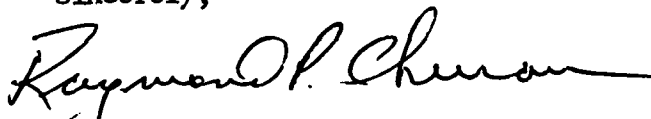
In summary, based on existing information, impacts to wildlife species should be minimal. However, there is no data to our knowledge on the effects of sonic booms day-after-day on wildlife species and their bodily systems. Indirect impacts such as broken water storage tanks could potentially affect wildlife species.

HYDROLOGY

9 The evaluation of possible impacts of sonic booms on water wells, particularly water wells of considerable depth, is not adequate (page 9-3, 9-4). The conclusions of the assessment are based on results of a study for NASA (Goforth, T. T. and McDonald, J. A., 1968, Seismic Effects of Sonic Booms: NASA Contractor Report, NASA CR 1137) which found that peak particle velocities recorded in a sealed vault at a depth of 44 feet were attenuated by a factor of 75 relative to those recorded at the surface (page 29). However, we note on page 18 of the NASA report that experimental conditions made it impossible to record ground velocity data from three seismometers placed in a deep well. The conclusion concerning attenuation of effects with depth is apparently based on energy losses incurred during transmission through sediments and does not consider effects from transmission of single or multiple overpressures directly down a deep, partially air-filled water well. We suggest that the analysis should address factors more specifically significant for wells, such as (1) effects of the sonic boom at the air/water interface, where great differences in compressibility will exist; (2) acceleration in the steel casing; and (3) intensification of overpressure effects by reflection and focussing by the walls of the drill hole.

We appreciate the opportunity to review the revised draft statement.

Sincerely,



Raymond P. Churan  
Regional Environmental Officer



ENV 10-5E



MARK WHITE  
GOVERNOR

OFFICE OF THE GOVERNOR  
STATE CAPITOL  
AUSTIN, TEXAS 78711

November 14, 1983

Mr. John O. Rittenhouse  
Deputy for Installations  
Management  
Deputy Assistant Secretary  
of the Air Force  
Department of the Air Force  
Washington, D.C. 20330

Dear Mr. Rittenhouse:

The Governor's Office has received for review the Draft Environmental Impact Statement on the proposed supersonic flight operations in the Valentine Military Operating Area. The state Environmental Impact Statement number assigned to this project is 3-07-50-137.

10 Comments from state agencies were generally favorable regarding this project. However, the Texas Aeronautics Commission recommended the Marfa VOR be upgraded to a VORTAC or VORDME to provide pilots with additional safety precautions. The Texas Parks and Wildlife Department requests the Corps to address the problem of survival of the peregrine falcon's eggs under the sonic vibrations to be generated. Comments are enclosed for your review. 10

We appreciate the opportunity to review this project. Please contact this office if we may provide further assistance.

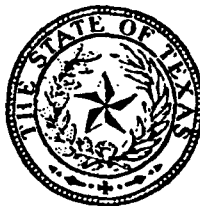
Yours truly,

A handwritten signature in dark ink, appearing to read "Robert E. McPherson".  
Robert E. McPherson  
Director of Planning

dfm

Comments enclosed: Texas Parks and Wildlife Department

James M. Johnson, Chairman  
Warren C. Harmon, Vice Chairman  
Jack H. McCreary, Secretary  
Lucien Flournoy, Member  
George M. Underwood, Member  
Melvin Phillips, Member



C. A. (Clay) Wilkins  
Executive Director  
P.O. Box 12607, Capitol Station  
410 East 5th Street  
Austin, Texas 78711  
(512) 476-9262

## Texas Aeronautics Commission

September 23, 1983

Mr. Harden Wiedemann  
Director  
Governor's Office of Planning and  
Intergovernmental Relations  
Intergovernmental Section  
Sam Houston Building  
Austin, Texas

Dear Mr. Wiedemann:

The Texas Aeronautics Commission has reviewed the Revised Draft Environmental Impact Statement Supersonic Flight Operations in Valentine Military Operations Area-Holloman AFB New Mexico (EIS#3-07-59-137) and offers the following comments.

We have been impressed by the Air Force's efforts to address all the environmental issues that have been raised and we will not comment on those.

The aeronautical issues have been addressed to our satisfaction and we concur with the findings in the report regarding the effects of the proposal on area aeronautical activity. However, as an added safety precaution to assist military and civilian air traffic in avoiding one another, it is recommended that the Marfa VOR be upgraded to a VORTAC or VORDME to provide pilots with distance as well as directional guidance from the facility.

We appreciate the opportunity to comment on the study. If you have any questions or need further information, please contact us.

Sincerely,

A handwritten signature in cursive script, reading "Merrill Goodwyn".

H. Merrill Goodwyn  
Plan, Programs and Research

tat

TEXAS  
PARKS AND WILDLIFE DEPARTMENT

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Austin, Texas 78744

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Dallas

WM. M. WHELESS, III  
Houston

August 12, 1983

Mr. John O. Rittenhouse  
Deputy for Installations Management  
Deputy Assistant Secretary of the Air Force  
Department of the Air Force  
Washington, D. C. 20330

Re: Supersonic Flight Operations in the Valentine Military  
Operations Area  
Revised Draft Environmental Impact Statement

Dear Mr. Rittenhouse:

The following comments are provided concerning the above-referenced document.

While the information presented appears to indicate that sonic booms do not negatively affect peregrine falcons, and would not reduce egg hatchability, comments should also address potential negative effects such as:

1. Possible ejection of eggs from nests by peregrines sufficiently disturbed by sonic vibrations, and
2. The potential for eggs physically vibrating from the nests.

Consideration of these points are important because even though sonic booms may have little affect upon adults, the loss of only a few eggs could be significant to the survival of this species.

The opportunity to review and comment on this proposed action is appreciated.

Sincerely,

*Charles D. Travis*  
Charles D. Travis  
Executive Director

CDT:RWS:jlm

8308469

1-13



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September 26, 1983

Mr. Robert McPherson, Director  
Office of Planning and Intergovernmental  
Relations  
Intergovernmental Section  
P.O. Box 13561  
Austin, Texas 78711

Subject: Valentine Military Operating Area, Van Horn, Texas  
EIS Number 3-07-50-137

Dear Mr. McPherson:

We have reviewed the above cited document and found it to be consistent with the State Implementation Plan.

Thank you for providing us the opportunity to review the document. If we can assist further, please contact me.

Sincerely,

A handwritten signature in cursive script that reads "Alex D. Opiela, Jr.".

Alex D. Opiela, Jr., P.E.  
Deputy Director  
Standards and Regulations Program

cc: Mr. Manuel Aguirre, P.E., Regional Director, El Paso





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STATE DEPARTMENT OF HIGHWAYS  
AND PUBLIC TRANSPORTATION

AUSTIN, TEXAS 78701

September 19, 1983

ENGINEER-DIRECTOR  
MARK G. GOODE

IN REPLY REFER TO  
FILE NO.

D8-E 854

Valentine Military Operations Area  
Revised Draft EIS #3-07-50-137

Mr. Harden Wiedemann, Director  
Governor's Office of Planning &  
Intergovernmental Relations  
Sam Houston Building  
Austin, Texas

Dear Mr. Wiedemann:

Thank you for the opportunity to review the revised draft environmental impact statement covering supersonic flight operations in the Valentine Military Operations Area.

The Department has no comment.

Sincerely yours,

M. G. Goode  
Engineer-Director

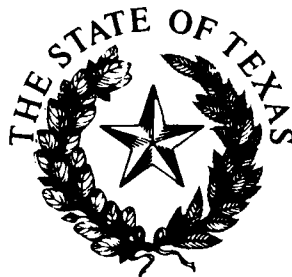
By:

*Marcus L. Yancey, Jr.*

Marcus L. Yancey, Jr.  
Deputy Engineer-Director

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GALVESTON ISLAND  
DR. DAN A. WILLIS, HOUSTON

# TEXAS HISTORICAL COMMISSION

P.O. BOX 12276

AUSTIN, TEXAS 78711

(512) 475-3092

September 29, 1983

Re: Revised Draft, Environmental Impact  
Statement, Supersonic Flight Operations  
in the Valentine Military  
Operations Area  
Holloman AFB, New Mexico

Headquarters  
Tactical Air Command/DEEV  
Langley AFB, Virginia 23664

Dear Sir:

Our office has reviewed the Revised Draft Environmental Impact Statement for the Valentine project area referenced above. Page 10-1 of the document contains the statement that "the Texas State Historic Preservation Officer indicated a determination of 'no effect'." Please reference our letter on page 10-8; the "no effect" determination applied to the rock art sites observed during the experiment conducted in June 1981, and was derived from only that data. We also suggested a monitoring program because the observations were made over a short period of time.

13 A review of the experiment data, Appendix I, reveals that the test flights produced only two detectable sonic booms; these two had recorded overpressures of 0.5 and 0.6 kg/m<sup>2</sup> (pg I-12, par. 1, and pg. I-13, par. 1). Training flights are expected to produce carpet booms with pressures as high as 25.3 kg/m<sup>2</sup> (pg. I-16, par. 3), which will be 40 to 50 times as powerful as those produced during the tests. In addition, focussed booms could generate still higher pressures. Thus, the lack of evidence of damage during the testing is not necessarily indicative of what could happen during actual operating conditions.

Rock art deteriorates gradually due to action of a number of nature forces. The rhyolite formations observed during the field experiment in 1981 spall in the course of weathering. The floors of some of the shelters are covered with spalls from the ceiling. When a spall area has become loosened from the parent rock, sonic booms may cause the spall to separate, and thus abruptly terminate a natural process which otherwise have required many years to complete.

13 Rock shelters in the Valentine test area probably number more than a hundred. Because an intensive survey of the area has not been accomplished, the number containing rock art are unknown, but such sites must be numerous. A number of these can be predicted to be potentially eligible for the National Register

Headquarters  
Tactical Air Command/DEEV  
September 29, 1983  
Page -2-

of Historic Places. One site, the Lobo Valley Site, 41CU9, is in process of nomination to the National Register of Historic Places, and has passed the State Board of Review.

We are of the opinion that sufficient information is not available at this time to accurately determine effect. Indirect effects (36 CFR Part 800,3(a)) including those caused by the undertaking that are later in time or farther removed in distance but are still reasonably foreseeable, may result from the operations of aircraft at supersonic speeds.

13 Because the undertaking has the potential to adversely affect archeological sites which are in process of listing or are potentially eligible for listing on the National Register of Historic Places, we request a memorandum of agreement be completed in consultation with the Advisory Council. The m.o.a. should recognize the potential for indirect adverse effects and stipulate a monitoring program to be developed by the Air Force in consultation with the Advisory Council and the Texas State Historic Preservation Officer. The memorandum can be published as part of the final EIS, with the monitoring program to be initiated as soon as possible following the development of the m.o.a.

Because we have no direct evidence of damage to archeological sites at this time, we do not request curtailment of flights.

Sincerely,

*LaVerne Herrington*

LaVerne Herrington, Ph.D.  
Deputy State Historic Preservation Officer

LH/cr

cc: Advisory Council

# west texas council of governments

TWO CIVIC CENTER PLAZA • EL PASO, TEXAS 79999 • (915) 541-4681

August 8, 1983

John O. Rittenhouse  
Headquarters Tactical Air Command/DEEV  
Langley AFB, VA 23665

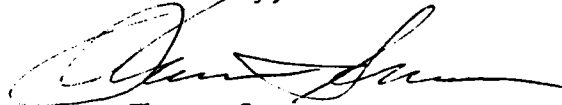
RE: GA-83-090  
SAI NO: 008-08-090  
Environmental Impact Statement  
Supersonic Flight Operations

Dear Mr. Rittenhouse:

The West Texas Council of Governments (WTCOG) is in receipt of the Environmental Impact Statement (EIS) on the proposed supersonic flight operations in the Valentine Military Operating Area (MOA). WTCOG reserves comment on this project.

Should you have any questions, or if we can be of any assistance, please do not hesitate to contact me.

Sincerely,



Thomas Serrano  
Director of Planning

cc: Department of the Air Force  
File



COMMENTS OF THE COUNCIL FOR THE PRESERVATION  
OF THE WEST TEXAS FRONTIER ON THE REVISED  
DRAFT ENVIRONMENTAL IMPACT STATEMENT OF  
THE UNITED STATES AIR FORCE REGARDING  
SUPERSONIC FLIGHT OPERATIONS IN THE VALENTINE  
MILITARY OPERATIONS AREA, HOLLOMAN AFB, NEW MEXICO

INTRODUCTION

The 49th Tactical Fighter Wing (TFW), stationed at Holloman AFB, New Mexico, proposes to fly approximately 300 supersonic sorties per month in the Valentine Military Operations Area/Air Traffic Control Assigned Air Space Area (MOA/ATCAASA). The purpose of this Critique, submitted on behalf of the Council for the Preservation of the West Texas Frontier is to comment on the Revised Draft Environmental Impact Statement (hereinafter referred to as "DEIS") submitted by the United States Air Force.

In enacting the National Environmental Policy Act, 42 U.S.C. § 4321-4361, Congress' stated purpose was "to declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; [and] to enrich the understanding of the ecological systems and natural resources important to the nation . . . ." Id. § 4321. In order to accomplish this end, the Congress has directed that all agencies of the federal government must:

Include in every recommendation or report on proposals for legislation and other major federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on

(i) The environmental impact of the proposed action,

(ii) Any adverse environmental effects which cannot be avoided should the proposal be implemented,

(iii) Alternatives to the proposed action,

(iv) The relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and

(v) Any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Id. § 4332 (2)(C). The requirement of a "detailed" environmental impact statement represents an environmental full disclosure law, such that administrative agencies of the federal government must develop and consider all of the environmental consequences of their decisions. Iowa Citizens for Environmental Quality, Inc. v. Volpe, 487 F.2d 849, (8th Cir. 1973).

It is the position of the Council for the Preservation of the West Texas Frontier that the Revised DEIS of the Air Force fails to meet the requirements of the National Environmental Policy Act. Before proceeding to a more detailed critique of the Air Force's DEIS, however, the Council and the Commissioners wish to point out that the Air Force has given no consideration to the environmental impact of its proposed supersonic sorties on the Republic of Mexico. The southwestern border of the Valentine MOA is coextensive with the United States/Mexican border. The Air Force studies, moreover, indicate that "28 square miles would be impacted by each sonic boom." Revised DEIS at 3-5. It is, therefore, apparent that the Air Force's proposal to conduct supersonic sorties in the Valentine MOA will impact Mexican territory. It is the position of the Council that the National Environmental Policy Act requires the Air Force to consider the consequences of its proposed action on those areas of Mexico likely to be exposed to sonic booms. See, Sierra Club v. Adams, 578 F.2d 389 (D.C. Cir. 1978).

For this same reason, the Air Force must also consider the impacts upon towns such as Van Horn, Baracho, Fort Davis, Marfa, and Presidio, all of which are within 24 miles of the boundaries of the MOA. Particular attention should be given to the effects upon Van Horn, since the northern boundary of the MOA would be subjected to a heavy volume of supersonic sorties. See, Revised DEIS at 3-7.

Furthermore, the Revised DEIS fails to meet the technical requirements mandated by the Code of Federal Regulations. For example, the Revised DEIS fails to "list the names, together with their qualifications (expertise, experience, professional disciplines), of the persons who were primarily responsible for preparing the Environmental Impact Statement or significant background papers, including basic components of the statement." 40 C.F.R. § 1502.17. Moreover, the Revised DEIS fails to "rigorously explore and objectively evaluate all reasonable alternatives" to the use of the Valentine MOA for supersonic

sorties. Id. § 1502.14(a). The Revised DEIS, like the initial DEIS, attempts to justify a decision already made by the Air Force, rather than objectively assess the environmental impact of the proposed action. Id. § 1502.2(g). In short, the Revised DEIS "is so inadequate as to preclude meaningful analysis," Id. § 1502.9(a), indicating the need for yet another Revised DEIS.

SPECIFIC OBJECTIONS TO THE REVISED DRAFT  
ENVIRONMENTAL IMPACT STATEMENT

For the convenience of the Air Force, the following format has been utilized in this critique. First, a verbatim quotation will be taken from the Revised DEIS. This quotation will then be followed by the comment of the Council for the Preservation of the West Texas Frontier.

1. "Annoyance factors suggested by CHABA coupled with EPA and HUD recommended noise level guidelines indicated that about 6 out of almost 700 people in the Valentine MOA will be highly annoyed. The day-night noise levels would be compatible with HUD criteria for a residential environment." Page iii.

17 | COMMENT: This purely artificial equation is totally at variance with the Air Force's own studies in St. Louis, Oklahoma City, and Edwards Air Force Base, see Revised DEIS at D-8 and D-9, where 27%, 35%, and 50% respectively, were "highly annoyed." In any event, calculating annoyance factors on the basis of an equation, rather than conducting a detailed survey during the test period of supersonic sorties over the Valentine MOA, is of questionable relevance. | 17

2. "The FWS has concluded the proposed action will not jeopardize the continued existence of the Peregrine Falcon."

18 | COMMENT: Curiously, the data supporting this conclusion is not included in § 3.2.3.2 of the Revised DEIS concerning the effect of sonic booms upon animals. Furthermore, no comment is made on the quotation from the initial DEIS to the effect that the falcon pulls its eggs or chicks off a cliff and an involuntary clutching startle reaction." Nor is a further quotation from the initial DEIS, to the effect that there is no conclusive evidence which indicates an adverse impact upon the reproductive/fledgling success of the Peregrine Falcon, commented upon in the Revised DEIS. Finally, there is no conclusive evidence that sonic booms | 18

18 | do not have an adverse impact on the Peregrine Falcon, al-  
though circumstantial evidence from the June 1978 testing  
does point that way. | 18

3. "Domestic animals . . . show very little behavioral effect from exposure to sonic booms. Available literature and special studies reviewed support the fact that animals and wild life can and do flourish in the presence of military aircraft operations, both subsonic and supersonic. Fletcher concludes if aircraft noise were an adverse impact, areas around large airports would be devoid of wild life. This is also true for military operating areas and it should be noted that noise levels and MOA's are normally less than that at busy commercial airports and military airfield [sic] with jet activity." Revised DEIS at IV.

19 | COMMENT: The short answer to this, in part, is that sonic  
booms do not occur at commercial airports. Furthermore,  
the sources cited by the Air Force are, for the most part,  
outdated. | 19

4. "Probable damage to structures should be limited and would primarily involve claims for window breakage." Page iv.

COMMENT: Window damage can and does occur to existing cracked windows which, due to a lack of previous external influences have not required replacement, but which, because of sonic booms, are destroyed and require replacement. While such damage may be relatively inexpensive, and thus not worth submitting a formal claim, this sort of damage nevertheless requires financial expenditures. Larger windows and patio doors, moreover, present a greater problem because the nearest supply and repair facilities are approximately 200 miles away.

5. "NASA's review of structural responses indicated overpressures less than about 11 lbs. per square foot should not cause damage. A 1977 evaluation on an adobe house in southern Arizona indicated the structure reacted similarly to conventional style structures." Page iv.

20 | COMMENT: Since neither the age nor condition of the adobe  
house in southern Arizona is disclosed, the results of this  
"test" are dubious. Comparing this one structure to hun-  
dreds of other structures of varying age and condition is,  
in effect, no comparison at all. | 20

6. "Possible impact to archaeological sites in the Valentine MOA was evaluated in July, 1981, and the study concludes that sonic booms are unlikely to cause any significant damage. Page iv

21 COMMENT: "Ten supersonic flights over two selected sites (six passes at 20,000 feet M.S.L. and four at 15,000 feet M.S.L.) produced two sonic booms. . . . Results of this test demonstrated that there will be no impact to archaeological sites and the Valentine MOA." The effect of two sonic booms is hardly definitive evidence of the effect of sonic booms on archaeological sites. The Council finds it difficult to understand how two booms in a one day period can possibly serve as an accurate prediction of what 200 booms will do.

7. "The potential for sonic boom impact on the local economy has been evaluated and determined not to be significant." Page v.

COMMENT: The Air Force's Economic Impact Study is addressed in a separate critique filed herewith.

8. "As a result of the information gained during the area visitation in March, 1978, the 49th TFW personnel relocated the originally proposed eastern area boundary because of a potential impact upon the McDonald observatory located 10 miles northwest of the town of Ft. Davis, the Ft. Davis historical site in Ft. Davis, and Harvard Radio Telescope located 4 miles northwest of Ft. Davis." Page 1-6.

22 COMMENT: At the most recent public meeting held by the Air Force on October 11, 1983, representatives of the Air Force stated that they required an area at least 40 miles in width. Currently, there are proposals to install a new 300 inch telescope on Mt. Livermore bringing the McDonald facilities 12 miles closer to the eastern boundary of the MOA. Presumably, the Air Force would again relocate the eastern boundary in the event these proposals are carried out. In the event this is done, the desirability of conducting supersonic sorties in the Valentine MOA is questionable from a military standpoint. In short, the MOA would simply be too narrow to be of any use.

9. "No window damage was reported during the test." Page 1-8.

COMMENT: It was reported that a window was broken in the Valentine High School library, endangering the children. Several residents, moreover, reported window and other property damages. No claims were made due either to minor dollar costs or discovery of damage long after it was done.

10. "An active public information program was initiated by the Air Force to explain impacts associated with area training. Area visitations, speaking engagements, town meetings and press releases have been directed at keeping the residents informed as to the status of the proposal, and explaining the need for this type of training to support national defense requirements." Page 1-8.

23 COMMENT: The residents and the Committee for the Preservation of the West Texas Frontier were informed of nothing after the April meeting until one was announced for August 3, 1978. Thereafter, no further "engagements, meetings, or press releases" appeared until November 15 when the Alpine Avalanche and KVLFF radio reported that subsonic training would begin the following Monday, November 20, 1978. In previous meetings, engagements, and press releases, as well as in the initial DEIS, the Air Force never indicated that it was planning subsonic training.

23

11. "Given the location of the supersonic operations, there is a low probability that, on the average, an individual would hear more than two to three sonic boom events per day." Pages 1-8 to 1-9.

24 COMMENT: An additional annoyance factor -- which is nowhere addressed in the Revised DEIS -- is the effect of afterburner detonation or shock, which has been likened to a minor sonic boom. The numbers of these events should also be predicted and analyzed by the Air Force in order to determine the ultimate distress impact upon the population.

24

12. "If supersonic operations are not conducted in the Reserve area, it would continue to be used for subsonic operations. Use of the Valentine area may then increase from 300 to 600 supersonic training sorties per month to augment the 600 supersonic sorties projected for the WSMR area." Page 1-9.

25 COMMENT: Nowhere in the Revised DEIS is the impact of increased operations discussed. Instead, the entire Revised DEIS proceeds on the assumption, which may not be warranted, that the total number of sorties will be equally divided between Reserve and Valentine.

25

13. "Civilian airfields nearby the Valentive MOA are located at Marfa, Presidio and Van Horn (Culberson County). These airfields are used by general aviation with no scheduled airlines operating in the vicinity." Page 1-12.

COMMENT: In addition, there are many private air strips on ranches throughout the area. Furthermore, soaring contests are held at the Marfa airport.

14. "The area is very sparsley populated, with an estimated total of less than 700 people residing within the boundaries. The only town in the area is Valentine, population 213. The towns of Marfa, population 2,647; Fort Davis, population 850; and Van Horn, population 2,240 are located outside the area boundaries." Page 1-17.

COMMENT: Unbeknownst to the Air Force, apparently, there are three towns within the southern flying ellipse which are not acknowledged: Candelaria and Ruidosa, near the Rio Grande, and the silver mining town of Shafter. The lack of Air Force interest in the impacted population was indicated by the comments of Air Force personnel at the October 11, 1983, meeting, in which Air Force representatives stated that Candelaria and Ruidosa were in Mexico, rather than Texas.

26 Furthermore, flights outside the MOA, through pilot error or over enthusiasm in pursuing a hypothetical foe, may well impact Marfa, population 2,466, just five miles from the MOA border; Van Horn, population 2,772, just 10 miles from the border; Kent, also 10 miles from the border; Presidio, population 950, and Ojinaga, Mexico, population 13,000, just 15 miles from the southern border of the MOA. In addition, there is no mention of the many Mexican ejidos and settlements, ranches, and farms along the Rio Grande in Mexico itself. Finally, it should be noted that the above population figures are based upon the 1980 census, correcting the Air Force figures in the Revised DEIS, which show Valentine with a population of 340 instead of 213 as indicated in the Revised DEIS. In sum, the total area to-be-impacted and possibly-to-be-impacted includes a population of approximately 22,000 people.

16. "Limited agriculture interests are present within the area due to the relatively arid conditions. Estimated existing land use is about 2% for agricultural endeavors, with an annual income of 2 to 3 million dollars. There are several large irrigated farms along Highway 90 where the

primary crops consist of cotton and grain. Correspondence dated February 1, 1979, from the Council for the Preservation of the West Texas Frontier (CPWTF) identifies a corn cultivation operation which is planned in the vicinity of Valentine."

COMMENT: In addition to the farming mentioned in the Revised DEIS, vineyard activity is increasing with future expansion and a winery envisioned.

17. "One of the area's important recreational activities is big game hunting."

COMMENT: Hunting, from the point of view of the residents of the affected area, is not a recreational activity; it is an economic resource. It cannot, however, continue to be so when either the hunter or his prey are startled by unexpected sonic booms, afterburner detonation, or other jet noise. Hunting, therefore, is expected to decrease markedly should this activity be implemented.

18. Reference the population data supplied by the Air Force at Pages 1-21 through 1-23.

27 COMMENT: As reported to the Air Force in the original critique of the initial DEIS, see Page G-129, these facts are in error. The errors have not been corrected and are, indeed, repeated. The Gulf Coast figure should be 3,000 lots, not 300. This same error is shown on Page 1-21. In addition, Green Valley is 2,560 lots, not 256.

27

Furthermore, there are at present more than 50 full-time households in the Davis Mountain Resort. The Air Force took no notice of the statement made at the meeting, see Page G-26, that "at Crow's Nest there is a camping ground that is made up of at least 30 campsites." The Air Force indicated that this information would be included in the Revised DEIS, but it is not.

In Apache Pines, almost all lots are now sold. Moreover, there are now two new developments: Warbonnet I and Warbonnet II totaling approximately 350 acres and 50 lots. Very few lots remain unsold, and there are now five full-time households and several persons preparing to build. Warbonnet I is across from Apache Pines and Crow's Nest; Warbonnet II is across from Bloys Campmeeting.



The lots offered by Gulf Coast, Green Valley and Hi-Chapparral, fully sold and fully developed, would comprise a potential population of almost 15,000 people, assuming that all were childless couples. This projection was supplied to the Air Force in the critique of the initial DEIS, see Page G-129, but it is not acknowledged in the Revised DEIS.

The central question, then, is whether the sonic booms resulting from the supersonic sorties will prevent this potential development, thereby causing great economic loss to the developers and the communities.

19. The Revised DEIS, with respect to Bloys Campmeeting, states that "the structures are wood frame with nailed on steel sheet: all with windows and septic tanks under-floor." Page 1-23.

28 | COMMENT: Bloys Campmeeting, in addition to an assembly hall, comprises more than 350 structures. Furthermore, many travel trailers remain there permanently. | 28

20. "To date, no complaints regarding the supersonic training proposal have been received from anyone identifying themselves as living or owning land in the Green Valley, Hi-Chapparral or Gulf Coast developments. No other real estate interests have been identified beneath the remaining portions of the area." Page 1-23.

COMMENT: Since Green Valley is a sales organization, it is in its best interest to understate the effect of sonic booms. This, coupled with the remoteness of the area and the obvious preference of its present residents to keep it that way, account for the silence on the part of both sellers and residents. Finally, and as noted above, since the publication of the initial DEIS, two new developments have been created: Warbonnet I and Warbonnet II.

21. "There are no known local governmental policies on land use relative to the proposed action." Page 2-1.

COMMENT: Texas counties have no ordinance powers; therefore, there can be no land use policies. There is, however, county opposition as reflected in a resolution of the County Commissioners.

22. "The representatives of the Davis Mountain Resort area have expressed much concern regarding the possibility that property values, tourism, and the quality of life in that area will decline if supersonic training is approved." Page 2-1.

COMMENT: Statements regarding a lack of economic impact, see Page v., are certainly at variance with this assertion.

23. "Thirdly, no supersonic flights will be authorized within a five nautical mile radius of the town of Valentine." Page 2-1.

29 | COMMENT: By the Air Force's own admission a sonic boom can have a dimension of 28 square miles. It appears the Air Force is literally playing dice with Valentine. During the test period alone, for example, two reported sonic booms occurred in Valentine itself. The question, then, is how many will occur in Valentine if and when the supersonic sorties begin. | 29

24. "The long term day-night average noise level (DNL) from subsonic flight operations in the Valentine MOA would not differ significantly from that currently experienced oposed [sic] supersonic flight is approved. (DNL is an equivalent sound level averaged over a twenty-four hour period with a 10 decibel penalty added to any sound that occurs at night.)" Page 3-2.

30 | COMMENT: The CDNL equation uses a 24 hour, 365 day base (8,760 hours), where a 12 hour, five day week (3,120 hours) is more appropriate for a limited activity. See Page 1-5. This was confirmed by the author of the equation, who, in correspondence with the Council for the Preservation of the West Texas Frontier, agrees the figure should be increased by three decibels to account for the 12 hour activity. In short, this calculation is irrelevant since sorties will be conducted during daylight only. | 30

25. "While these impact noises may irritate, startle and awake people, a high degree of behavioral habituation is normally seen in humans when the exposure is repeated." Page 3-14.

31 | COMMENT: This statement misrepresents the facts concerning sonic booms in a manner that will cause untrained individuals to draw the wrong conclusions. For example, the statement could cause some individuals to conclude that most individuals will "habituate" to all the booms in time. | 31

31 Furthermore, it is apparent that the Air Force has failed to consult key papers on the effects of sonic booms on people. Two writers have concluded that "adaptation to booms with intensities of 1.6 and 2.1 PSF were not found during these [NASA] tests." Lukas & Kryter, 1968 NASA-CR-1193. Two others report that there is no adaptation evident after exposing humans for 12 nights to one PSF sonic booms. Collins & Iampietro, 1973 EPA Symposium on Noise as a Public Health Hazard. Finally, Thackary, et al., in 1973 FAA-AM-73-11, concludes that there is "some evidence of habituation to low and moderate level sonic booms, but no real evidence of habituation to extremely high boom levels." Furthermore, the authors state that "it is doubtful that complete habituation would ever occur in all individuals even to the lowest levels employed in the present study."

31

This part of the report is written in a way that tends to deceive the general public in order to support the Air Force's case.

26. "The startle response has been investigated by R. Rylander where a group of volunteers were exposed to 5 to 12 booms with overpressures ranging from 1.2 to 12.8 PSF. The presence of startle reactions was assessed by using a hand-steadiness test, recordings of heartbeat frequency and a tracking test. The results show startle reactions could be characterized by an increase in gross muscular movements immediately after the boom and a slight increase in the heartbeat frequency and muscle contractions in the arm and back. Changes were momentary and disappeared within a few seconds after exposure. It should be noted the average increase in heartbeat frequency was about two beats per minute. When the subjects were exposed to noise from a pistol shot the heart rate increased an average of nine beats per minute. The test also shows tendency to habituation after about 10 sonic boom exposures." Page 3-14.

COMMENT: The reference to the work of Rylander indicates a failure to consult the primary source. The reference cited in the Revised DEIS is not Rylander's original study. Rylander has published three key works on the effects of sonic booms on humans.

32 Furthermore, the statement about the modest increase in heart rate due to sonic booms as compared to pistol shots might mislead some individuals to conclude that this would be a harmless event. Even a modest physiological

32

response such as the one reported in this study, however, could have adverse health consequences if it occurs over a period of years. The Air Force has no studies to show that it is harmless and many studies now show that exposure to high noise levels for long periods of time will cause adverse health effects. A failure to qualify this statement tends to encourage the untrained person to think that such a modest increase might be harmless. The last sentence in the paragraph, mentioning a tendency to habituation after about 10 sonic boom exposures, clearly indicates how careless the drafters were in preparing this section. It does not substantiate the last sentence in the preceeding paragraph to the affect that a "high degree of behavioral habituation is normally seen."

27. "There have been several studies conducted on the effects of loud noises and sonic booms to people; however, CHABA provides their consensus on the published data. CHABA was asked by the National Institute for Occupational Safety and Health (the research arm of OSHA) and EPA to consider research that might be performed to examine the effects on human health from long-term noise exposure for industrial workers and the general population respectively. The primary question was whether those noise standards established to safeguard hearing are sufficient also to protect against health disorders other than hearing defects. CHABA's conclusion was: 'evidence from available research reports is suggestive, but it does not provide definitive answers to the question of health effects, other than to the auditory system, of long-term exposure to noise. It seems prudent, therefore, in the absence of adequate knowledge as to whether or not noise can produce effects upon health or other than damage to the auditory system either directly or mediated through stress, that insofar as feasible, an attempt should be made to obtain more critical evidence.' CHABA reported that many of the available foreign studies could be critized on methodological basis (studies were not adequately controlled for other known risk factors). Studies in the United States primarily concentrated on cardiovascular response to noise, and the results have been contradictory. CHABA recommended guidelines for future research on the subject." Page 3-14.

COMMENT: First, the Council for the Preservation of the West Texas Frontier agrees completely with CHABA on at least one issue: an attempt should be made to obtain more critical evidence. The question, then, is whether, in view of the "suggestive research reports" and the need for more

research, the Air Force is justified in proceeding with its plans. We do not believe so. When issues of human health and well-being are concerned, extreme caution should be used. We further submit that this proposal is in violation of the spirit of Air Force Regulation 55-34, Item 3: "commanders must take every precaution to protect communities and the civilian population from major invasions of the public domain through annoyances and risks associated with flight operations."

Furthermore, the findings of CHABA are now two years old in a field undergoing an information explosion. For example, the link between noise levels and hypertension is receiving considerable attention. Raloff, 1982 "Science News" 121:377-381, reports that "more than 40 studies, many of them involving industrial workers, have shown a link between high levels of noise and cardiovascular changes." A recent and especially well-done study appears to establish the link loud noise exposure and hypertension:

We have demonstrated for what we believe to be the first time in a carefully controlled experiment that moderate levels of realistic noise, presented at appropriate times throughout the day, can produce sustained elevations in blood pressure without producing significant changes in auditory sensitivity. While extrapolation from one species [rhesus monkeys] to another [human beings] must always be undertaken with caution, we have provided evidence, based on a primate model, that these two categories of events may occur independently in humans exposed to moderately intense noise over long periods of time. Further, we have demonstrated that noise effects do not necessarily dissipate when the noise ends.

Peterson, et al., 1980, "Noise Raises Blood Pressure Without Impairing Auditory Sensitivity," Science 211:1450-52. In our opinion, this is precisely the type of controlled experiment, using a primate model that CHABA has recommended. This study was apparently overlooked by the Air Force.

28. "There are some scientists who believe the link between noise and ill-health is well defined. Worthington's article, 'The Potential Health Effects of Sonic Booms on Human Population,' stresses that data he has reviewed is 'indicative of possible effect' that sonic booms can cause a hearing loss and other ill-health conditions.

"As EPA points out, a number of factors must be considered in predicting the effect of impulse noise on people. While the peak sound pressure level, duration and rise time are useful in characterizing an impulse noise, the number of and time interval between impulses and audiometric frequency must be considered along with an individuals [sic] susceptibility to inner ear damage, orientation of the ear with the respect to the noise, action of acoustic reflex and additive conditions of other continuous noises in order to assess effects on people.

"Previously discussed data indicate the average person should hear no more than two to three booms a day and the energy of these booms are primarily through the five through one-hundred hertz range (considerably below that of gunfire and most industrial noise), thus, the Air Force does not consider that sonic booms or focus booms will cause any permanent hearing loss. This is supported by the fact that test conducted in 1968 at Tonspah, Nevada, showed that sonic booms with overpressures ranging from 50 PSF to 144 PSF did not cause direct injury to the exposed people. Subjects exposed to simulated air bag noises at peak levels as high as 80 PSF showed that small temporary changes in hearing were mainly caused by the high frequency noise and not the low frequencies as found in sonic booms. The Air Force does not consider the level of overpressures or frequency of sonic booms projected for the Valentine MOA to be significant in respect to possible hearing loss." Page 3-15.

COMMENT: The problem with these assertions is that new evidence contradicts the Air Force's contention that no hearing loss damage will occur.

Four species of vertebrates, guinea pigs, mice, chinchillas and rhesus monkeys were exposed to simulated sonic booms of varying overpressure, rise time and frequency. The main finding was the pressure of a blood clot in the scala tympani of the basal or lower middle turn of the cochlea and defect of hearing in the upper range of the perceived frequencies.

Reinis, et al., 1960, "The Effects of Sonic Booms on Hearing and Inner Ear Structure," Scand Audiol., Suppl. (Sweden) No. 12, Pages 163-169.

29. "CHABA has evaluated the hazard of pre-natal noise exposure and report: 'There is no conclusive evidence of detrimental effects of high-intensity external sound in

higher mammals. Tones of 100-120 dB. at the mother's abdominal surface are attenuated by the mother's body and the tissue and fluids surrounding the fetus by approximately: 20-20 dB. for single frequencies from 50 to 200 Hz.; 25-30 dB. at 500 Hz.; 40 dB. at 1,000 Hz.; 50 dB. at 2,000 Hz.; and 70 dB. or more at 4,000 Hz. and higher frequencies. Internal background noise levels of 70-85 dB. SPL have been measured in the vicinity of the fetal head; the background noise is probably generated by the mother's circulatory system." Page 3-15.

COMMENT: The selection of quotations and data in this statement completely misrepresents to the public the findings and concerns expressed in this report. In the first place the stated goals of the project were as follows: (1) to determine the potential hazards of noise exposure to embryos or fetuses of pregnant women; (2) on the basis of then current knowledge, to determine whether limits could reasonably be specified for conditions of noise exposure; and (3) to determine and what research efforts, if any should be encouraged in order to better understand the first two questions. This is what CHABA discovered: "The following brief report reviews the research considered relevant by the working group, points out the problems and limitations encountered in this research and its evaluation, and concludes that on the basis of available data definite answers cannot be given to questions one and two. Recommendations are made for further research." Furthermore, CHABA concluded that the fetus does respond to high intensity sound:

[T]he overall evidence, in view of the controls used in the studies reporting changes in the fetal heart rate, favors the view that changes do occur in response to high-intensity vibratory sounds or sound stimuli applied to abdomen of the mother. The changes are neither large or consistent. There is no evidence that the changes are injurious in themselves or that they represent injury elsewhere in the fetus.

The response by the fetus to high intensity noise matches some of the responses observed in adults, for example startle response. The CHABA conclusions do not mean that CHABA considers this type of physiological response harmless, only that we do not as yet have evidence of the adverse health effects. For this reason, CHABA concluded that until better information is available, it would appear

prudent for pregnant women to avoid exposures to long duration (several hours per day) of sounds of 90 dB. SPL and above, the maximum level currently suggested by the U. S. Department of Labor for unprotected ears.

35 The omission of the this statement becomes clear when one considers the following. Examine Tables 2 and 3, at Page 3-6 of the Revised DEIS, for the distribution of different sonic boom overpressures expected in the Valentine MOA. The mean overpressure expected is 2.81 PSF. How loud is that boom in decibels? If our calculations are correct, that sonic boom would register 136 decibels, or forty thousand times louder than the recommended level of 90 decibels set by the CHABA group. One necessarily wonders what would CHABA have said about that exposure level on a daily basis during pregnancy.

30. "In respect to other potential ill-health effects, Kryter, in summary of his review and tutorial paper of physiological effects of noise states, 'It is more likely that noise related general ill-health effects are due to the psychological annoyance from the noise interfering with normal everyday behavior, than it is from the noise eliciting, because of its intensity, reflexive response in the autonomic or other physiological systems of the body. The psychological stresses may cause a physiological stress reaction that could result in impaired health.'" Page 3-15.

COMMENT: This quotation was taken from a highly conjectural paper that is not supported by the current literature and is not widely accepted. The Peterson study supra, is the type of current study that refutes Kryter. Additionally, one further study puts to rest Kryter's conjecture. Raloff, 1982, Science News 121; 377-381, references a study by Muzet and Ehraht on physiological responses of the human the human body to noise experienced during sleep. Raloff concluded:

36 What is probably most important is that though we can intellectually tune out noise, physiologically, our bodies never adapt. That is why these changes continue to occur even during sleep as Alain Muzet and Jean Ehraht demonstrated graphically in research at the Centre d'Etudes Bioclimatiques due CNRS in Strasbourg, France. Three men and three women (aged 19 to 24 years) were allowed to adapt to sleeping in their laboratory. After three quiet nights Muzet and Ehraht bombarded their sleepers for the next



fifteen nights with a barrage of traffic sounds. Played over loud speakers at rate of thirty per hour, the noise randomly exhibited peak intensities of 45, 55 or 65 dB<sub>a</sub>. Heart rate, finger pulse amplitude and pulse wave velocity were measured throughout the night, and each sleeper filled out a questionnaire upon wakeing. After the first two to seven nights, the subjects no longer reported having been disturbed by the noise during their sleep. However, their bodies failed to habituate. As a sample log of their heart rate shows, loud noise temporarily spiked heart rate as much as four-fold and effects measured the fifteenth night were identical to those logged on the first night. "Such a result raises the question of what are the long-term effects on the cardio vascular system of low-intensity (and perhaps even unnoticed) noises that occur during sleep," the researchers conclude.

The importance of the Muzet and Ehraht study is that, first, it refutes the contentions of Kryter that it might not be the sound causing the adverse health effects. Sleeping people have their psychology (i.e. fears, values, opinions, etc.) tuned out during most of the sleep period. Secondly, the study demonstrates the failure of the body to physiologically habituate to these low intensity sounds. Thus, it now appears that even low intensity sonic booms, to which some people might habituate, will still add to the stress load of the individual. Habituation may not free the individual from the stress caused by the sound.

Kryter, however, did make one point, that being that psychological factors can contribute to ill-health. This is generally known anyway. If a person becomes annoyed by something and responds physiologically, then that could add to the effects being caused by the noise. The situation could be much worse than Professor Worthington originally anticipated in critiquing the initial deis. Furthermore, the Air Force has used a scale to predict annoyance that is now considered by some experts to under estimate the problem. Worthington, himself, has criticized the Revised DEIS for utilizing his paper as the "worst-case." For the benefit of the Air Force, Worthington's letter to the Air Force is produced in full on the following page.

740 Tepic  
El Paso, Texas  
79912  
October 17, 1983

HQ TAC/DEEV  
Attn: Mr. Alton Chavis  
Langley AFB, VA 23665

Dear Sir:

This letter contains my formal objections to selected material contained within the Revised Draft EIS's for the Valentine MOA and the Reserve MOA. This letter is to become a part of the permanent record for both documents and is to be included in any final or revised EIS's for those areas.

In both EIS's it is alleged that the Worthington health effects paper represents "worst-case." This is not true for the following reasons:

1. With the limited time and library resources available to me I was only able to review about half of the literature published up to 1978 linking loud noise exposure to adverse health effects.
2. The Worthington report is now over five years old. With the recent information explosion in the area of noise pollution and health at least 100 more studies have been published that the Air Force has not bothered to examine.

In order for the Air Force to meet its responsibilities under NEPA to properly represent "worst-case" the following must be done:

1. Review the studies that were not available to Worthington. (Perhaps 50 studies.)
2. Review the relevant recent studies (1978-1983). I would estimate that about 100 more studies are now in the literature.
3. List all studies reviewed in a comprehensive bibliography so that the completeness of the analysis can be evaluated.
4. Provide a revised summary of findings.

The failure of the Air Force to go beyond the efforts of Worthington is inexcusable. To represent the Worthington study as worst-case is misrepresentation for the reasons stated above. This is one more example of how these draft EIS's fail to meet the objectives of NEPA.

Sincerely yours,

*Richard D. Worthington*  
Richard D. Worthington, Ph.D.  
Associate Professor of Biological  
Sciences

cc: selected opposing groups.

31. "If the social surveys adequately predict the level of annoyance in accepting Kryter's position, then it could be concluded that if other physiological effects occur they should be generally limited to that segment of the population predicted to be annoyed. In this respect, 6 of the 122+ people living in the operational areas are projected to be highly annoyed." Page 3-18.

COMMENT: The problem here is that Air Force under estimates annoyance. The importance of properly estimating the number of people that are likely to annoyed by the proposed infliction of sonic booms cannot be stressed strongly enough. A relationship between annoyance and health exists.

39 The question, then, is why does the Air Force not tell us how many people are likely to be annoyed. What the Air Force has predicted is the number of people living in the operations area that are likely to be highly annoyed. One necessarily wonders how many people will be moderately annoyed, slightly annoyed, or annoyed to any degree. Why did the Air Force fail to provide us with this information? Could it be, as we surmise, that the number that are likely to highly annoyed is the smallest number, thereby creating a false illusion of this impact having little effect.

The point is, when health is related to annoyance one must look at all degrees of annoyance. In the Oklahoma City sonic boom study, for example, more than 50% of the people were annoyed by the sonic booms to some degree. Is that what the Air Force does not want to show?

40 Furthermore, the C-weighted method of predicting annoyance is not the most appropriate method. Where human health and well-being are concerned, any method that more accurately estimates annoyance must be considered. The problem with the C-weighted method is that it was devised for noises like traffic noise, not lower frequency impulse type noises. The instrument actually fails to register all the energy in lower frequency ranges, thereby leading to consistent underestimates of annoyance. A recent paper addresses this problem and proposes a new method to predict annoyance:

40 Considering all these uncommon characteristics of exposure, it is reasonable to inquire whether a dosage-effect relationship such as that synthesized by Schultz for transportation noise is

appropriate for assessing community response to blasting. By the same token, it is also reasonable to inquire whether a general dosage-effect relationship for impulsive noise is appropriate for characterizing community response to blasting. Blast noise contains even more low-frequency energy than sonic booms or artillery fire, and is commonly accompanied by much more intense vibration than other impulsive noises.

\* \* \*

Given this evidence to suggest that ground vibration levels must exceed some centile-related threshold level to engender annoyance, it is reasonable to inquire further how annoyance with individual events is proportional to the number of blasts that exceed the apparent threshold. The common assumption (embodied in the  $10 \log N$  term) is that annoyance grows in strict proportion to the energy of repeated events. Figure 5 shows that the prevalence of annoyance can be predicted with greater precision if it is assumed that annoyance grows considerably faster than the energy of repeated blasts. The adjustments to the 83rd centile levels if figure 5 is not  $10 \log N$ , but  $10 \log N^3$ . The resulting increase in statistical association between the revised measure of ground vibration level and prevalence of annoyance is notable: the regression accounts for almost 80% of the variance in the annoyance data.

Fidel et. al., 1983, Community Response to Blasting, J. Acoust. Soc. Am. 74 (3): 888-893. With repeated exposures annoyance figures climb much more rapidly for blast type noises (and probably also for sonic booms) than would be predicted by traditional methods. The Fidell study quite convincingly demonstrates this. The Air Force should utilize this method. Where human health and well-being are concerned, accuracy is extremely important.

In sum, § 3.2.1 of the Revised DEIS suffers from the following general defects:

(1) The failure to consult key papers describing the effects of sonic booms on people;

(2) The misrepresentation of important findings;

(3) A writing style which uses generalizations and carefully selected quotations that, while technically correct, encourage the untrained reader to draw false conclusions;

(4) The use of conjectural opinions not widely accepted in the field;

(5) A failure to consult primary source material that is easily obtainable; and

(6) The failure to present all of the data on different levels or degrees of annoyance.

A dispassionate review of the scientific literature and the documents produced by the Air Force leads to the conclusion that the present documentation is inadequate as a foundation for an environmental impact statement, due mainly to the selective nature of the evidence and facts presented, and at times to the apparently deliberate distortion of scientific data.

32. "Presidio, approximately 50 miles south of the MOA, is an official customs point of entry and will produce some GA (General Aviation) traffic mostly in the northeast-southeast direction." Page 3-25.

41 | COMMENT: Presidio is 15 miles, not 50 miles from the MOA border. | 41

33. "The Crow's Nest and Apache Pines projects are nearby on route 118 in the south Davis Mountain area but have experienced relatively little activity."

42 | COMMENT: Crow's Nest, Apache Pines, and the new War Bonnets I and II developments are not, as stated, experiencing relatively little activity. Instead, these developments have sold almost all of their available lots. Moreover, they are located off of Highway 166, not Highway 118. | 42

34. "Analysis of sonic boom activity on real estate development and land values in the four control MOA's indicates that values have been increasing. There is no evidence that sonic booms are having a deleterious effect on land values. No significant impact is expected in the Valentine MOA if the proposed action is implemented." Page 3-29.

COMMENT: Since there are no sonic booms at present, prospective buyers do not know of the problem, nor are sellers about to inform them of the coming undesirability of the land.

35. "The location [of Holloman AFB] is well suited for overseas deployments from the continental United States. Additionally, F-15's positioned at Holloman enhance air defense capabilities in the south central portion of the United States." Page 4-10.

43 | COMMENT: Nonetheless, it would appear that a Florida location would, logically, be better suited to overseas deployment to Europe, Central America, the Mideast, and Africa. | 43

36. This comment relates to the statistics set forth in table 9 on page 4-11.

44 | COMMENT: This cost comparison between Valentine and Tyndall is misleading. At a cost per sortie of \$5,146.88, 3,600.00 sorties to Tyndall would cost \$18,528,768.00, an increase of only \$5,802,768.00 more than Valentine for the same number, not the \$16,920,024.00 inferentially indicated by the table. | 44

37. "Area residents have suggested that the 49th TFW be relocated to a Texas Gulf Coast military base to conduct supersonic flights over water." Pages 4-12.

45 | COMMENT: Area residents have suggested that the Corpus Christi Naval Air Station facility be considered since the Navy is no longer using it. Furthermore, the Army, which is using only part of it, is saddled with housekeeping and maintenance cost for the full facility. This option, however, was apparently never considered by the Air Force. Why? | 45

38. "The adverse impact on the morale of Air Force personnel required to support this alternative is another factor which must be considered." Page 4-13.

COMMENT: The "adverse affect on the morale of Air Force personnel" who, by the very nature of their employment, have agreed to and expect to be deployed to places not necessarily of their choice, cannot be compared to the adverse affect of an aerial battlefield upon the morale of people who cannot move away and who are to experience its effects.

39. "Mexican constitutional restrictions do not allow foreign military aircraft over Mexico." Page 4-14.

46 | COMMENT: A logical question in light of these restrictions is whether the Mexican government approves of the proposal to fly supersonic sorties in the Valentine MOA. It must be remembered that the border of the MOA is coextensive with the United States border with Mexico. Given the range of sonic booms, it is clear that Mexican territory will be impacted. | 46

40. "Reference Figure 15, the potential for establishing a new MOA for T-38 and/or F-15 operations is very limited due to the present number of MOA's, restricted areas, and high/low altitude airways. All air space within operating range of the T-38 (80 nautical miles) is completely saturated with existing areas and airways. Therefore, the feasibility of developing another area for T-38 operations to allow F-15 use of the talon area appears unlikely. When the 150 mile operating range of the F-15 is considered, possibilities for establishing a new area are limited due to the concentrated network of high and low altitude airways." Page 4-14.

47 | COMMENT: It would appear that maintaining the 49th TFW at Holloman is the basic error. Perhaps the TFW should be placed in a new position where its growth will not be hindered or inhibited by human or environmental concerns. It is apparently so circumscribed at present by so much other Air Force activity in its vicinity that it appears to rate a very low priority with the Air Force itself. Furthermore, the fact that only the northern 1/3 of the MOA is within the 150 mile operating range of the F-15 would appear to mitigate against the choice of Valentine. See Page 1-9, Figure 6. | 47

41. "No area expansion is possible to the north due to the town of Van Horn and the numerous communities located along Interstate 10. Expansion to the east is limited by the McDonald observatory, Harvard Radio Telescope, Davis Mountain Resort area, and the city of Marfa." Page 4-19.

48 | COMMENT: The potential use of Mt. Livermore by McDonald observatory, as noted earlier, precludes any expansion of the Valentine MOA, and, indeed, may instead constrict it into uselessness, indicating that the Valentine MOA is an illogical choice to begin with. | 48

42. "The anticipated noise level is less than the sixty-five DNL established by HUD as an acceptable acoustical environment for residential use. The cumulative noise level from sonic booms in the highest exposure area has a C-weighted day-night average sound of 58 dB." Page 5-1.

49 COMMENT: The equation employed to reach this figure is incorrect. Instead of 15 times 7 times .08 equal 8.6, the equation should read 15 times 5 times .08 equal 12, adding another 1.5 decibels to the equation on page D-33. Dr. Galloway states that a 12-hour operation adds three decibels. Since the 5-day operation adds 1.5 decibels, the final total is not 63.9 decibels, but 68.9 decibels, well over the accepted HUD and EPA levels. Even without taking into account the peak powers that are the basic problem in sonic booms. While one foot in boiling water and one in ice water will average out to be comfortable, this theory simply will not work in human terms. The statement that the highest level will be 58 dB is, therefore, incorrect; a minimum of 4 1/2 dB must be added to any stated maxima throughout this Revised DEIS.

43. "Claims for property damage and personal injury as a result of Air Force sonic boom activities are processed in accordance with the procedures set out in Air Force Manual 112-1. Claims for sonic boom damage are most often handled under Chapter 7 of the manual which implements the military claims act (Title 10, United States Code, § 2733). This act authorizes the Air Force to pay for damages or injuries caused by 'non-combat activities'. A 'non-combat activity' includes supersonic flights and sonic booms that are created by such flights. A claimant need not allege or prove a negligent or wrongful act by military or Air Force civilian personnel in order to recover under this theory. The claimant need only prove a 'causal connection' between the authorized non-combat activity and the injury or damage claim. The claimant can assist his/her case by making a record of the exact time the damage occurred and/or a sonic boom was heard. This aids the claims office handling the claim in determining whether an Air Force claim was supersonic at that time." Page 5-3.

50 COMMENT: The implication of this statement is that the Air Force will fully and fairly compensate property damage. This is difficult to believe in light of the Air Force's own records, which indicate that from 1959 to 1970, the Air Force paid only \$1.7 million dollars in structural damage



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claims out of \$30.6 million dollars in claimed, a paltry 6%. Furthermore, the Air Force paid only \$128,000.00 in claims against actual claims of \$900,000.00 for animal damage, or 14%; \$100,000.00 against \$610,000.00 in mink production claims of damage, or 17%. Of claims against damage to chickens, horses, and cattle, only \$21,500.00 was paid against \$144,000.00 in claims, or 6.7%.

50

Furthermore, the Air Force's own test show that in Oklahoma City, minor unreimbursed home repairs increased 60% during the 6 month test period. While the Air Force keeps citing this test throughout the Revised DEIS, they never mentioned this curious fact.

44. "Payments for property damage are most often based on the repair cost of the item damaged or the depreciated replacement cost of the damaged item, whichever is less." Page 5-3.

COMMENTS: Considering the age of the majority of structures located in the Valentine MOA, this method of compensation is totally unfair.

45. "Sonic boom claims for damage may be denied for one of two reasons: (1) there was no Air Force aerial activity being conducted at the time the damage occurred; or (2) the damage resulted from other causes, for example, structural deficiencies or water damage." Page 5-4.

51

COMMENT: Since there has never been any structure ever built in the Valentine MOA to FHA or VA standards, all structures in the area will have, in the Air Force's eyes, "structural deficiencies" and will therefore, ipso facto, be denied full compensation for damage claims.

51

46. "The area, remotely located and sparsely populated, is considered by some as the 'last unspoiled frontier'." Page 6-1.

COMMENT: This being so, is it necessary that this area, too, must be despoiled?

47. "Although commercial and recreational interests are present in other sections of the area, the scale of such endeavors appears to be limited with no indication of significantly increased potential for development in the future." Page 6-1.

COMMENT: As previously noted, two new subdivisions have been created in the area and others are planned.

48. "The economic impact study, Valentine and Morenci Military Operations Area, May, 1980, concluded from all available information, that the proposed supersonic operations would not significantly impact the economy in and near the Valentine MOA." Page 6-1.

52 | COMMENT: At the time the Economic Impact Study was completed, a request for the copy was denied on the grounds that it was "classified." Being given no opportunity to analyze the study, it is presumptively flawed since information given to the interviewer by two ranchers, a realtor, a county official, and others is at variance with the conclusion that there will be no adverse economic impact. | 52

49. "Because of safety considerations, pilots operating in any flying area insure that flight operations are confined within the designated air space." Page 6-1.

53 | COMMENT: Since November 20, 1978, when the Air Force began its subsonic activity, supersonic activity resulted in an average of 20 booms per year being reported just outside the eastern boundary, indicating an equal number at various other points in the MOA (probably 75 to 100 a year overall). The 20 per year were reported to the Washington Depository as well as to the command at Holloman AFB. | 53

50. "Members of the committee voiced opposition to the proposal through letters to congressional representatives, news media and Air Force officials. A petition was circulated within and near the area for signatures of area residents opposed to the supersonic training. A total of 165 names from the people residing within the area boundaries plus 70 names from the town of Valentine appear on the petition. The names of 243 citizens residing outside the area boundary are also listed in the petition." Page 9-1.

54 | COMMENT: Copies of the Petitions referred to were requested by the 49th TFW, together with typed copies of the names for inclusion in this document. The promise of inclusion, however, was not kept. Accordingly, copies of the petition are attached to this critique as Appendix B. | 54

51. "At the request of the committee, Commissioners from Jeff Davis County passed a resolution opposing the Air Force Proposal. In addition, three city councils and the

Commissioners from Brewster County, all areas east of the proposed area, passed resolutions to support the protest committees efforts." Page 9-1.

55 COMMENT: This resolution, as well as copies of those from neighboring towns and counties, were to be reproduced in the Revised DEIS. Another unkept promise. 55

52. "Many ranchers and cattlemen in the West Texas are depend on water storage tanks to provide water for their livestock. The tanks are constructed of various materials including native rock material, concrete blocks, and pre-fabricated steel tanks. Most of the tanks are interconnected with a gravity flow pipeline. The water tanks require periodic maintenance to prevent seepage and loss of water." Page 9-2.

56 COMMENT: In considering potential damage to water tanks, it must be remembered that most of the large rock ones are from 50 to 75 years old, and would probably be ruled "structurally deficient" under Air Force standards. With proper maintenance, however, they remain serviceable and supply cattle in remote areas with needed water (25 gallons per day per cow). Damage to a tank, undiscovered for a week, could result in weight loss and dehydration death of an entire herd before being discovered. Does the Air Force intend to insure 100% compensation would be made for the cattle, even if the tank were discounted for its "structural deficiencies?" 56

53. "Twenty-four area resident questionnaires were received by the 49th TFW in response to the test. Two questionnaires were submitted by a resident from the town of Valentine listing three different booms. Five were from the residents ten miles west of Valentine reporting 14 different booms. Seventeen questionnaires were submitted listing a total of 29 people located along the eastern area border referencing the one sonic boom at about 1:10 p.m. on June 22. A total of 18 different sonic booms were reported by area residents. This total, as a percentage of the total pilot reported booms, equates to 9%. The 49th TFW realizes that area residents may have perceived a much large percentage of the sonic booms than were reported via the questionnaires." Page B-6.

COMMENT: One resident of the town of Valentine reported two sonic booms despite the Air Force's promise that Valentine would be avoided by a 5-mile radius. As the Air

57 Force itself acknowledges, a total of 18 different sonic booms were reported by area residents. Page 1-8. We simply do not know how many sonic booms were heard but not reported. Furthermore, the Marfa Airport had 1,000 questionnaires in a box under a table. Ten days after arrival they were still there, unopened and well hidden, although the table displayed all kinds of other material. The question, then, is why were the questionnaires hidden in an airport at Marfa, thirty miles away, instead of being available in Valentine itself. 57

54. "No report was received in indicating any window breakage resulting from test operations." Page B-8

COMMENT: Window damage, including that in the Valentine High School library was reported. No claims ensued because of the expense and time of the claims procedure, as well as the probable denial of such a claim.

55. "Even though area resident questionnaire response to the test was minimal, there remains opposition to the proposal from some residents beneath and adjacent to the area." Page B-9.

COMMENT: Inasmuch as the questionnaires were 55 miles away in the Marfa Airport, it is not surprising that response to the Air Force's questionnaire was "minimal." The Council for the Preservation of the West Texas Frontier, moreover, would assure the Air Force that opposition to the proposal to fly supersonic sorties in the Valentine MOA is anything but "minimal."

56. "Complainers were more often middle aged females with older children and smaller families." Page B-9.

COMMENT: As used in this context, the term "complainers" is more pejorative than informative. One who files a complaint is not necessarily a "complainer" in the accepted sense of the word.

57. "This procedure relates a percent of a population that would be expected to be highly annoyed by the sonic boom environment to the C-weighted day-night average sound level (abbreviated as CDNL) in dB. This measure is the long term average of the C-weighted sound levels accumulated over a 24 hour period, with a 10 dB penalty to events that occur after 10:00 p.m. and before 7:00 a.m." Page D-10.

58 | COMMENT: As previously noted, this method of measuring, taking a 24-hour average to determine the decibel impact, is irrelevant when used to measure a daylight only activity confined to a 12-hour duration. | 58

58. "Eleven typical types of residential structures were instrumented and exposed to eight sonic booms per day at over-pressures of zero to 3.5 PSF. The test program consisted of 26 weeks of eight daily controlled sonic booms having intensities in the range of zero to 3.5 PSF (median peak over-pressure of 1.2 PSF) followed by thirteen weeks of observation and inspection of the structures to determine the normal rate of deterioration as compared to the rate of deterioration found during the 26 week sonic boom period." Page D-10.

59 | COMMENT: As noted earlier, the Air Force does not go on to cite the equally important finding that the test caused a 60% rise in minor damage repairs caused by the sonic booms. | 59

59. "The extensive series of overflight tests have provided valuable data on the order of magnitude of responses to be expected. These tests show that building structures in good repair should not be damaged at boom overpressures less than about 11 lbs. per square foot. However, it is recognized that considerable loading variability occurs owing to atmospheric affects, and that the residual strength of structures varies according to usage and natural causes. Thus, there is a small probability that some damage will be produced by the intensities to be expected to be produced by supersonic aircraft." Page D-14.

COMMENT: It is a verifiable fact that very few structures in the Valentine MOA are "in good repair" since the region contains only old structures. While suitable and adequate to their present uses, these structures are being put to unnecessary, uncalled for, and unwarranted risk. The resources, moreover, do not exist to repair damage and there is little knowledge of proper claim procedures. Finally, no one is certain that the Air Force will make full restitution with its record of 6% compensation payments.

60. "In 1977 an adobe house in southern Arizona was instrumented and evaluated while supersonic training was taking place overhead. The conclusion of the evaluation was that the adobe structure reacted similar to a conventional style structure. Based on this analysis, there should be no difference in the probability of damage to an adobe structure or a conventional structure. Page D-14.

60 COMMENT: This is the third time this mysterious house in southern Arizona has been cited by the Air Force. We still do not know anything about its age or condition, however, that qualifies it to be the standard to which the 50 to 75 year old adobe structures in the Valentine MOA should be judged.

61. "By far the largest percentage of sonic boom damage claims stems from broken or cracked glass damage. All of the tests conducted in the United States have confirmed that glass damage is the most prevalent damage caused by sonic booms. Because the microstructure of glass is amorphous rather than crystalline, the practical design strength of glass is a surface condition property rather than a constant material property. What this indicates is that the strength of glass is dependent on the surface scratch condition. Glass that has been sandblasted, scratched or nicked will not exhibit the same strength as a properly installed relatively new pane of glass." Page D-15.

61 COMMENT: Again, the question is compensability. Consider a cracked window pane left in a position undisturbed for years and perfectly serviceable, which is shattered by a sonic boom, thereby causing cost, travel to distant towns for replacement (Van Horn, 40 miles, Ft. Davis, 42 miles, Marfa, 30 miles, etc.), annoyance, and continuous adjudication for something not "structurally sound." With respect to people with large windows or sliding glass doors, their nearest source of supply and repair is El Paso, over 200 miles away. In this regard, the Air Force has never indicated whether it will consider consequential costs such as travel and time to be compensable.

62. "A study of reindeer reaction to sonic booms revealed that at low levels of over-pressure (0.3 psf to 0.5 psf) the animals react with temporary muscle contraction and minimal or undetectable interruption of activities. Higher levels of over-pressure (up to 10.5 psf) caused the reindeer to raise their heads, look around and sniff but never produced a reaction strong enough to bring resting animals to their feet. Panic movements were not observed, but neither was adapting to startle noted." Page D-18.

62 COMMENT: While admitting that reindeer do not adapt to startle, the Air Force conveniently overlooks the conclusions of the report, which are:

(1) It was inconclusive because it was done during the reindeer's "quiet time of year" (i.e., no stress due to gestation, caving, or feeding);

62

(2) The Lapps do not corral their reindeer during thunderstorms since they would panic and stampede, nor do they do so during sonic boom-making periods; and

62

(3) It stated that sonic booms could have negative influences on reproduction.

In sum, the authors admit the test is totally flawed because of the time it was done, yet draw conclusions from even that which would indicate ill effects on reindeer. Nonetheless, the Air Force blithely states that the reindeer never even "got up on their feet."

63. "One well documented study reveals that supersonic over-pressures may have affected a wild bird reproduction rate. During 1969 in a Sooty Tern breeding colony of a Florida Key, the birth rate of young terns was 1.3% of the expected rate. The possible causes, including weather, predation, food shortage, over-dense vegetation in the colony, pesticides, and disturbance by man were investigated and discounted. Three very intense sonic booms between May 4 and and May 11 may have caused embryo damage due to egg abandonment or physical damages to uncovered eggs. (Over-pressures of 100 psf or more have been generated by aircraft flying supersonically within 60 feet of the ground.) Birth rates in preceding and succeeding years were normal." Page D-18.

63

COMMENT: It is exceedingly difficult to reconcile this well-documented experience with Sooty Terns with the somewhat offhanded conclusions reached concerning the Peregrine Falcon. This is especially true in light of the Air Force's own admission in the initial DEIS that the falcon pulls its eggs and chicks off a cliff in an involuntary clutching startled reaction.

63

64. This comment is directed to figures 4 and 5 on pages D-30 and D-32, respectively.

COMMENT: Note the occurrence of out-of-bounds flights by Air Force pilots. This reinforces the position of the Council for the Preservation of the West Texas Frontier that the Air Force must consider the environmental impact upon areas outside the geographical boundary of the Valentine MOA.

65. "In the Valentine test of June, 1978 pilots reported 205 supersonic events, of which 18 caused booms reported by residents." Page D-33.

The Air Force, however, does not cite the known but unreported booms heard by area residents, giving the false impression that of 205 booms, only 18 were reported. Since only 18 were reported, the Air Force makes the assumption that only 18 were heard. The validity of this assumption is, of course, questionable in light of the Air Force's acknowledgement that not all booms were reported.

66. "The above calculations for CDNL were based on 15 sorties per day for each five day week. For ten sorties per day the CDNL values are 1.8 dB lower; for 5 sorties per day, CDNL is reduced by 4.8 dB. Page D-34.

64 | COMMENT: Once again, the 24-hour weighting is unrealistic and unfair, in view of the fact that Air Force sorties will be flown during a 12-hour period. | 64

#### CONCLUSIONS AND SUGGESTIONS

65 | 1. The Air Force must address the health effects of the perception by the human ear and brain of "double" sonic booms; i.e., over-pressure and under-pressure stimulation. Furthermore, the Air Force must address the issue of weighting this effect into its C-Weighted calculations. The reasons for the decision to include or not to include this data must also be stated in the next Revised DEIS. | 65

66 | 2. The Air Force must address the issue of disruption of communication and interruption of attention span of children, inasmuch as two schools will be impacted by the proposed testing. Answers to some of these questions may be found in the literature that the Air Force has overlooked. | 66

3. The Air Force must review all of the studies and reports that describe the effects of sonic booms on people. Less than half, and perhaps less than one-quarter, of the important studies have been read and reviewed. The following must also be done:

(a) the Air Force must list all of the sonic boom studies that it has reviewed so the completeness of the impact analysis can be evaluated; and



66 (b) the Air Force must then summarize the results, such as effects on hearing, eye-hand coordination, adaptation to booms, etc. 66

4. The Air Force must complete its annoyance calculation. In other words, the Air Force must show how many people will be "slightly annoyed," "moderately annoyed," or annoyed to any degree. Even the Air Force has already referenced papers that link annoyance to ill-health.

67 5. The Air Force must also use the latest models that better predict the number of people that will be annoyed by lower intensity impulse noise. At least one new method is now available that will better predict the degree of annoyance. Since health is a consideration, it is critical that the most accurate models for predicting annoyance be utilized. The Air Force must further show in a table the various predictions for each method. 67

68 6. In connection with the foregoing, the Air Force must discuss the C-weighted measure as it relates to accurately recording the energy in sonic booms. The Air Force must consider the current contention that C-weighted measures consistently underestimate low frequency impulse noises. 68

69 7. It is critical that the Air Force compile a demographic profile of the impacted population within the Valentine MOA. The Air Force must provide the data for the number of persons in the MOA as well as in the specific test areas. The profile must be complete enough to be of value in predicting the number of births each year, as well as numbers of the individuals in each age class by sex. No one can make any prediction of health impact without this data. 69

8. Given the Air Force's acknowledgement of the startle effect of sonic booms, the Air Force must consult with:

- (a) a leading cardiovascular physiologist,
- (b) a leading heart specialist, and
- (c) a leading obstetrician.

Such consultations are critical. The Air Force must ask each of these individuals if repetition of the startle effect will aggravate or worsen any medical condition known to them. Furthermore, the names of the experts and the opinions they voice must be recorded.

9. If leading health experts fear that certain conditions might be worsened by such exposures, the Air Force must then consult the current medical literature for the known rates of occurrence of these disorders, and then determine from the demographic table just how many people might be affected in the Valentine MOA. These predictions should be made for 5-year and 10-year exposures as well.

70 | 10. The Air Force must review the recent paper reporting sonic boom ear damage in Rhesus monkeys. It must accordingly revise its conclusions on the potential for ear damage in light of recent findings. | 70

11. The Air Force must review both CHABA reports to present both sides of the issues, rather than select sections that happen to support its case. The spirit of at least one of these papers is misrepresented.

71 | 12. If the Air Force wants to reference the 7-year old study of Worthington as "worst-case," then they must sponsor an update study to show the true worst-case. | 71  
Worthington only reviewed half of the literature in the field at this time. Another 100 papers have been published since then. A worst-case study would require a new synthesis of the information in at least 150 more studies.

13. The Air Force must update the 2-year old CHABA report. All the new material must be referenced and an unbiased assessment must be made to determine if any of the conclusions have been changed. It is our opinion that they have.

14. The Air Force must review its use of the conjectural paper by Kryter to reference its point since he even admits that the preponderance of evidence does not support his views.

APPENDIX A CRITIQUE OF THE ECONOMIC  
IMPACT STUDY DATED MAY, 1980

Before proceeding to a paragraph-by-paragraph examination of the economic impact study as it relates to the Valentine MOA, the following discrepancies between White Sands, Gladden, Sells, and Valentine should be pointed out. First, White Sands with an area of 5,000 miles of 100% public land, but only 150 affected residents, is economically lumped in with a \$200,000,000.00 economy of cities and towns not effected by the supersonic sorties. Similarly, Gladden, with 85% public lands, has its minimal population economically lumped in with Phoenix' and Prescott's \$20,000,000,000.00 dollar annual economy, almost none of which is affected by sonic booms. Similarly, Sell's 71,000 square miles are primarily poor Papago Indian reservation, but their limited economy is lumped in with Tucson's \$5,000,000,000.00 economy; Tucson, however, is not subjected to sonic booms.

Nonetheless, in spite of these differences, all these "apples" are compared to the "orange" of Valentine, which has no public land and no big city economies to disrupt the picture. Consequently, the only true economic numbers in this statement are Valentine's. The areas to which Valentine is compared are immensely distorted by the inclusion of unaffected metropolitan areas.

72 Further distortions that result in comparing these areas with Valentine are as follows:

(1) In White Sands, an outside population of approximately 20,000 people and 400 business establishments was extrapolated to indicate what the economic impact is on just 150 people, a ratio of 120 to 1.

(2) For Gladden, it was 1,700,000 people and 12,000 business establishments, on fewer than 1,000 people, a ration of 1,700 to 1.

(3) For Selles, we could find no population figures. When Tuscon's 500,000 population and 3,700 business establishments are compared to not more than 7,000 Papago Indians and their handful of small stores and gas stations, the ratio must be close to 70 to 1.

(4) In Valentine, however, the ratio is far different. A population of 6,300 projected against an effected population of 700 yields a ratio of only 9 to 1.

72

As with any social "science" such as economic impact, no solid law can result from extrapolation from such disparities. Any businessman knows that better than any theorist. Only conjecture can result and our conjecture is as good as any theorist. Our conjecture, moreover, is tempered by practical experience.

Turning to the specifics of the Economic Impact Study, the same format used in critiquing the Revised DEIS will be employed here.

1. "The proposed supersonic flight area was geographically designed to avoid populated areas to the maximum extent possible." Page 206.

73

COMMENT: The fact that towns such as Van Horn, Marfa, Presidio, and Ojinaga lie outside the geographic border of the MOA does not necessarily mean that these areas will not be impacted when one considers the fact that a sonic boom has the potential to impact 28 square miles. In reality, a total of 25,000 people are potentially affected by the Air Force's proposal to conduct supersonic sorties in the Valentine MOA.

73

2. "Two alleged property damaged claims were directly attributed by residents to test booms. Air Force claims personnel have promptly responded and have investigated each claim submitted or alleged." Page 207.

COMMENT: What the Air Force fails to indicate is that on one claim, Air Force personnel responded by saying "the plaster would have cracked in the course of time anyway."

3. "The area is very sparsely populated, with an estimated total of less than 700 people residing within the boundaries. The only town in the area is Valentine, population 213." Page 209.

74

COMMENT: These figures need to be updated. Furthermore, as was pointed out in the Council's critique of the Revised DEIS, the Air Force has ignored several communities lying within the Valentine MOA. Furthermore, as we have repeatedly stated to the Air Force, areas of substantial population, which lie outside the geographic boundary of the MOA, are impacted by the proposal to conduct supersonic sorties.

74

4. "Van Horn, Kent, and Sierra Blanca on the north have emerged as service areas for the traveling public on I-20." Page 210.

75 | COMMENT: The highway to the north is I-10, not I-20.

| 75

5. "Big game hunting is an economically important activity in the area. Commercial hunting for mule deer, javelina and antelope on private ranch lands attracts numerous resident and non-resident sportsmen in the area each year. Annual income from the sale of hunting leases is estimated at \$1,000,000.00 by the Council for The Preservation of the West Texas Frontier though research for this Economic Impact Study found that income is only approximately \$300,000.00." Page 212.

76 | COMMENT: As stated to the researcher compiling this study, hunting income is above \$1,000,000.00. Lease income is approximately \$300,000.00 as stated. The \$700,000.00 balance is attributable to fuel, tires, parts, repairs, food, beverages, ammunition, butchering, cold storage, taxidermy, lodging, licenses, etc., all of which benefits the towns of Ft. Davis, Marfa, Alpine and Van Horn.

| 76

6. These comments are directed to the population data assembled on Page 216 and tables B-2, B-3, and B-4.

77 | COMMENT: This data needs to be updated. Between 1970 and 1980, contrary to the Economic Impact Study, Jeff Davis County gained population. The same is true of Valentine and Presidio County. In addition, the census indicates a stabilization in the population of Marfa. The Council for the Preservation of the West Texas Frontier questions whether this growth can continue in light of the Air Force's proposal to turn the skies above the area into an aerial battlefield.

| 77

7. These comments are directed to the employment and personal income data compiled and set forth on Pages 220 through 227.

COMMENT: This already dismal picture certainly, by the most dreamy-eyed projections, cannot be improved by the Air Force's proposal to conduct supersonic sorties over the area.

8. These comments are directed to the data compiled and set forth in the study concerning retail trade. Pages 228-232.

COMMENT: Court house records indicate a decline, not an increase in eating establishments in Jeff Davis County. Moreover, there have always been two building materials stores in Ft. Davis. Furthermore, the decline in food

stores in Jeff Davis County is not "because of new and larger units, new and large units may have been added" but because reduced gas costs enable shopping in Alpine for larger variety and lower prices.

The growth of Presidio, moreover, reflected the growth of Ojinaga, across the river in Mexico. Ojinaga supplied a substantial portion of Presidio's economy until the recent peso devaluations.

9. "No data were analyzed concerning farming activities in the Valentine MOA because of the lack of importance of such industries to the MOA." Page 239.

78 | COMMENT: Comments such as these are nothing less than  
incredible. Two very large farms, a vineyard, and a large  
pecan orchard exist near Valentine. In addition, onions  
and cantelopes are grown near Presidio, and two vineyards  
flank Blue Mountain on Highway 166. | 78

This statement is also at odds with the subsequent statement that "there are two areas where a significant amount of crop farming is occurring within the MOA." Page 246.

10. "About 35 permanent homes are currently occupied in the [Davis Mountain Resort] development. . . ." Page 242.

79 | COMMENT: More than 50 permanent homes now exist in the  
Davis Mountain Resort. | 79

11. "Officials of the [McDonald] planetarium were contacted to determine what, if any, possible effect the sonic boom activity would have on their operation. The planetarium is supported jointly by the National Science Foundation and the State of Texas." Page 243.

COMMENT: The McDonald observatory is not a mere "planetarium." Instead, it is a full fledged, world renowned multi-telescope observatory. Comments such as these reflect the ignorance of Air Force officials of the impacted areas within and along side the Valentine MOA.

12. "However, the boundary lines of the Valentine supersonic MOA were drawn so that no sonic booms are anticipated at the observatory." Page 244.

COMMENT: Unfortunately, sonic booms have been experienced at the visitor center and telescope complex at the observatory.

13. "Tourist facilities and services. . . are located in several towns adjacent to the MOA (Van Horn, Marfa, Ft. Davis and Kent). It is unlikely that sonic booms would have any affect on this segment of the economy." Page 244.

COMMENT: The noticeable absence of data to support this conclusion speaks for itself. Our position is that sonic booms will discourage hunters and other visitors to this area. The affect of this will ripple throughout the local economies.

14. "Ranch land sells in the range of \$60.00 to \$120.00 per acre on a gross basis (20-50 sections or about 12,000 to 30,000 acres)". Page 245.

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COMMENT: A Ft. Davis realtor estimates a decline of at least \$10.00 per acre value in the event the Air Force's proposal to conduct supersonic sorties is carried out. This is an aggregate property value loss of \$14.5 million.

80

#### CONCLUSION

81

As with the Revised DEIS, the Economic Impact Study is incomplete and incorrect in many respects. Moreover, it has been 3 1/2 years since the study was compiled. It is the position of the Council for the West Texas Frontier that the report should be revised.

81

EXHIBIT "B"



# P E T I T I O N

Although our homes are not exactly within the borders of the proposed Military Operating Area, we are near enough to its edges to be adversely affected by the shocks and noises of sonic booms. Fearful of their effects on our health, our homes, our incomes and our quality of life, WE SINCERELY PETITION that this proposal be withdrawn forthwith.....and FOREVER.

ALL (12)

Name (one to a line)	Location
<del>Mr. George [unclear]</del>	H. Davis, Tx.
<del>Mr. George [unclear]</del>	H. Davis, Texas
Bertine Woodley	Fort Davis, Texas
Barbara L. Standup	Fort Davis, Texas
Johnny [unclear]	Fort Davis, Tex
Nancy Hutchover	H. Davis, TX
Edith [unclear]	H. Davis, Texas
Edith [unclear]	H. Davis, Texas
Lee Ray Jacques	H. Davis, TX
Richey G. Martinez	H. Davis, Texas
Linda J. Dranado	H. Davis
Linda Bencomo	Marfa
Ernest Meadows	H. Davis
Raymond Dudy	H. Davis
Edward Silva	Fort Davis, Tx
Eliseo Benth	Fort Davis, Tex
Eliseo Alvarado	Fort Davis Tex
Bill Hutchover, Sr.	St. Davis, Tex
Carol Jacques	Et. Davis, Tx.
Olivia Lara	Ft. Davis TX
Henry Lara	H. Davis, TX
Ben Martin	Fort Davis, TX.

(16)

# PETITION

Although our homes are not exactly within the borders of the proposed Military Operating Area, we are near enough to its edges to be adversely affected by the shocks and noises of sonic booms. Fearful of their effects on our health, our homes, our incomes and our quality of life, WE SINCERELY PETITION that this proposal be withdrawn forthwith.....and FOREVER.

Name (one to a line)

Location

Susan Kimball	Alpine
Barney Nelson	Oakland, Alpine
Pearl M. Nelson	Alpine
Ray Potts	Alpine
<del>Robert</del> Vicki Shannon	Alpine
Charles E. Shannon	Alpine
Matt E. Shannon	Alpine. 5/4 Ranch
John C. Odell	Alpine
Joyce Bramlett	Alpine
Jan C. Long	Alpine
Joyce A. Terry	Alpine
George L. Bradley	Alpine
Kendall Bradley	Alpine
Landra R. Deal	Alpine
Kester Stromberg	Alpine Tex
Ron Davis	alpine TX
Merced Mining	alpine TX
Rut Zimm	Alpine "
Frank E. Fairchild Jr.	Tulipus Ranch
Patt. Falkenberg	Alpine
Mrs. Maurice C. G. Clark	Alpine
Michael Potts	Alpine

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ALL (12)

Name (one to a line)	Location
Carmel Hodges	Hwy 17 3 miles North F.D.
Tam Hodges	Hwy 17 3 mi North F.D.
Christie Dillard	Audubon Acres F.D.
White	Ft. Davis
Bridget Garratt	Box 302 Ft. Davis
George Rodriguez	Ft. Davis, Tx 79734
Brynn McAllen	Ft. Davis, Tx 79734
Chas Wade	Ft. Davis, Tx
Ken Wheeler	Ft. Davis, Tx
Virginia Gonzales	Ft. Davis, Tx
Mrs. Wade Reid	Ft. Davis, Texas.
Mary Ann	Fort Davis, Texas
Margaret Lilley	Ft. Davis, Texas
Dee Verrell	Ft. Davis
Jason Verrell	Ft. Davis
Budd Todd	Ft. Davis
Richard Renfai	" "
Duncan Krill	Ft. Davis

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Name (one to a line)

Location

CAROLE HODGES	Hwy 17 3mi No of FD
TOM HODGES	"
CHRISTI DILLARD	Ft Davis Audubon Acres
AL WHITE	
BRIDGET JARRATT	
GEORGE RODRIGUEZ	
BONNIE McKINNEY	
CHAS WADE	
KAY WHITLEY	
VIRGINIA GONZALES	
MRS WADE REID	
HARVEY RHEES (?)	
MARGARET TILLEY	
DEE HERRELL	
JASON HERRELL	
BUDD LADD	
RICHARD RENDON	
DUNCAN PARISH	

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Name (one to a line)

Location

F. T. Smith	H. Davis, Tex.
Ralph E. Fisher	Marfa, Texas
Frank L. Carty	San Antonio Texas
Bob Blankenship	Odessa, Texas
Gene Paputt	Fort Davis, Texas
Fred Parrott	Fort Davis, Texas
N. E. Sprunt	H. Davis, Tex.
Edna Muehl	Fort Davis, Texas
Virgie Graue	Ft Davis Tex
J. C. Duncan Jr	Ft Davis Tex.
Blanche C. Dennis	Ft Davis Tex -
Mr and Mrs Pat Mallery	Ft Davis Texas
Mr and Mrs Dick Lueck	Van Horn, Texas
Mr. and Mrs. Charles Dyer	Biggs, Tex
Mr & Mrs. M. R. Blount	Alpine, Texas
Mrs. J. P. Seale	Marfa, Tex.
Isabel A. Yates	Marfa, TX
Doris Taylor	Ft. Davis, Tex.
K. G. Thompson	H. Davis, Tex.
Mrs. J. C. Duncanson, Sr	Ft. Davis, Tex
Jeanne Duncan	Ft. Davis, Texas
Gertrude B. Stone	Ft Davis, Texas





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Name (one to a line)

Davis Mt. Resort

Location

ALL 8

H.W. McFadden	Davis Mt. Resort
W.R. Fitts	" " "
Joe Haynes	Ft. Davis Resort
George E. Pauls	Ft. Davis
Quinn Scudway	Ft. Davis DMR
W. Faulkworth	" " DMR
W. Blum	Mulberry St. Ft. Davis
Steve Whistfield	Houston TX 77070
Walter Matthews	DMR - Ft. Davis
Wayne Matthews	" " "
Lisa M. Munkle	Davis Mt. Resort
Richard D. Northington	✓
Patricia A. Northington	✓
Paul Beutman	Ft. Davis Resort
Margi Haynes	Ft. Davis Resort
Wynn Haynes	" " "
Tom Haynes	" " "



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Davis Mt. Resort

ALL (8)

Name (one to a line)	Location
Isabel L. Webster	Davis Mt. Resort
Ruth Russell	Davis Mt. Resort
Jimie Metcalfe	Davis Mt. Resort
James L. Hall	Davis Mt. Resort
<del>W. H. Goff</del>	" " "
Mr. Rick Mott	" " "
Mrs. Helen Locke	" " "
Rich Moon	" " "
Edward L. Hall	" " "
Mary B. Hardy	" " "
Ed H. Jones	" " "
Cecil V. Driggers	✓ ✓ ✓
Johnie Driggers	✓ ✓ ✓
George C. Knowlton	✓ ✓ ✓
Helen L. Lynn (Mrs. H. L.)	✓ ✓ ✓
Robert W. Matthews	✓ ✓ ✓
Wilma Matthews	✓ ✓ ✓
E. M. Price	" " "
Helen Price	✓ ✓ ✓
Barry Matthews	" " "
Howard Gibson	" " "
Pat Gibson	" " "

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ALL (12)

Name (one to a line)

Location

Sid Brown	El Paso Tex	①
Babara Seaman	Alpine Tex	
Patricia Watts	Ft Davis	
Randy King	Ft Davis Tex	
Pat B. Wall	Fort Davis, Tex	
Sandy Cano	Ft Davis Tex	
Hally Jariato	Ft Davis, Texas	
Chon Cano	Ft Davis Tex	
Betty Cano	Ft Davis Tex	
Kathryn Diller	Ft Davis, Tex	
Roy Sandberg	Ft Davis Texas	①
Frances Hauer	Fort Davis, Tx.	
Lynne Watts	Fort Davis	
<del>Pat B. Wall</del>	" "	
Lommy Villanueva Jr	Alpine Texas	
Delia Witt	Fort Davis, Texas	
Scott Shepherd	Fort Davis, Tex	
Mary Parish	Ft Davis Texas	
Freddy Pico	" "	
Colin Dutchase	Ft Davis Texas	
Robert B. Cavin	Fort Davis, Texas	①
Aren Cavin	Ft Davis	

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ALL 12

Name (one to a line)	Location
Marie Guerin	P.O. Box 419
Raydon W. Hildes	Hwy 117 to Alpine - Ft Davis
T. J. Reely	Fort Davis, TX
W. J. Metchell	Resort, Ft. Davis, Tex
Betty Edmonson	Box 573 Ft. Davis, TX
C. L. Williams	Box 247, Ft. Davis, TX.
Glen Merland	Box 594 Ft. Davis, Tex
Larry Webster	Box 333 Ft. Davis, Tex.
Kelly Garrett	Box 302 Ft. Davis, Tex
Quinton D. Cargill	P.O. Box 581 Ft. Davis, Texas
Charles H. Hines	Ft. Davis, Tex
Frank Molinar	Box 296 Ft. Davis, Tex
Tom M. Nelson	Box 292 Ft. Davis, Tex
John M. Nelson	Box 432 Ft. Davis, TX
Rollen Reiley	Box 600 Ft. Davis, TX
Jim Cottle	Box 1431, Ft. Davis, Tex
Russell Chappell	Box 591 Ft. Davis, Tex
Shock Gillet	Cyna Rd, Parkton, Md
Virginia H. Hines	Box 599 Ft. Davis, Tex
Shirley Hines	Box 384 Ft. Davis, Tex
Mary Alice Nelson	Box 432 Ft. Davis, TX
J. D. Morelli	Box 1449 Ft. Davis

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ALL (12)

Name (one to a line)

Location

Jo Ann Lara	H. Davis, Texas
Mary B. Lara	H. Davis, Texas
Brigida Lara Jr	H. Davis, Texas
Danny Esmedo	H. Davis Texas
Francis Esmedo	H. Davis Texas
Jay L. Farnatt Sr	H. Davis, Texas
Mrs. Jay L. Farnatt Sr	H. Davis, Texas
Eloisa Bustamante	H. Davis, Texas
Leola Bustamante	H. Davis, Texas
Lude Rubio	H. Davis, Texas
Robert Rubio	H. Davis, Texas
Rudy Lara	H. Davis, Texas
Joe Alvarado	H. Davis, TX
Delma Holguin	H. Davis, TX
Manuela Novarete	H. Davis, Texas
Elma Jacquez	H. Davis, Texas
Socorro Jacquez	H. Davis, Texas
Angelita Dutcher	H. Davis, Texas
Jane M. Jimenez	H. Davis, Texas
Mr. Elias Jimenez	H. Davis, Texas
Mr. Elias Jimenez	H. Davis, Texas
Bon Lara	H. Davis, Texas

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ALL (12)

Name (one to a line)	Location
Mrs Ben Martin	Ft. Davis, Texas
Stella Newton	Fort Davis, Texas
Zora Webster	Ft. Davis, Texas
Jean Webster	Ft. Davis Texas
Euler Jimenez	Ft. Davis, Texas
Silvestra Molinar	Box 296 FT. DAVIS TEXAS 79734
P. N. Johnson	Box 801 Ft Davis Texas
Edith K. ...	Ft. Davis, Texas
Jack ...	Ft. Davis, Texas
William ...	Ft. Davis, Texas
George ...	Ft. Davis, Texas
George ...	Ft. Davis, TX
Karen ...	Fort Davis
Garrick ...	Box 827, Ft. Davis
Gr ...	Ft. Davis Tx 79730
Bob ...	Ft. Davis
Bob Sproul	Sproul Ranch, Ft. Davis
Butta ...	Ft. Davis, Texas
Duffy ...	Ft. Davis, Texas 79734
Mita ...	Ft. Davis, Tx 79734
Sarah ...	Ft. Davis, Tx. 79734
Preston D. Chappell	Ft. Davis, TX. 79734

15

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Name (one to a line)	Location
Pearline Statts	Alpine, Tx. 79830
Connie Potts	Alpine TX
Chris Lacy	Fort Davis TX
Paul Karmen	Alpine TX.
Dan B. Danner	Alpine TX
Carol Luginberg	Alpine TX
Judy L. Cox	Alpine, Tx.
Cardyn Milder	Alpine, Texas
Elyse & Dege	Alpine Texas
Mike Potts	Alpine, Texas
Robert V. LaFarelle	Alpine, Tx.
Mac Morris	Alpine TX
Bruce Platten	Alpine Tex.
Mrs. John R. Whitaker	Alpine, TX
Val Clark Bond	(Brewster County)
Brenda Ross	(Brewster Ct.)
Alyna M. Conner	Prudis, Tex.
Mrs. Vicki Potts	Alpine
Laurie Whiteaker	Alpine
Debra Truitt Bering	Alpine
Kathleen N. Stoddard	Alpine
Lara H. Dean	Alpine, Tx

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ALL 14

Name (one to a line)	Location
Helen M Myers	Fort Davis, Tex.
Engene V. Murphy III	Box 428 Fort Davis, Tx.
Robert R. Ray	Box 287 Fort Davis
John Hartnett	Box 426 Ft Davis Tex
Daniel H. Vazquez	P.O. Box 414 Ft Davis, Tx.
Andall Joseph Feldell	Ft Davis Tx
Al Ohaine	Ft Davis Tx
Dr. Derek Wells	McDonald Observatory
Dr. Ben Wells	McDonald Observatory
Robert R. (Robert Fonzalez)	FT Davis TX
Donald E. Williams	Fort Davis Texas
Bill Lynd	Fort Davis, TX
A.W. Moss	Fort Davis, Tex
Auración Urias	Box 325 Ft. Davis, TX
Jane Went	McDonald Obs
Nana Dee Lee	Box 1337, Ft. Davis
Edward Outchover Jr	Box 1337, Ft. Davis Tx.
Harold Schaafsma	Box 817 Fort Davis, Tx.
Linda Dwyer	McDonald Obs.

**FINAL**

## CRITIQUE "A" of the REVISED DEIS Dated July 1983

- 82 1. Page iii, penult. para: "(studies cited) indicated that about 6 out of 700 people in the Valentine MOA will be 'highly annoyed.' This purely artificial equation is totally at variance with the AF's own studies in St Louis and Edwards AFB and FAA's in ~~OK~~ City (see later further references in this critique) where 27%, 50% and 35% respectively were 'highly annoyed' instead of the 1% projected for Valentine. 82
- 83 2. Page iv, 3rd line: "The Fish and Wildlife Service has concluded the proposed action will not jeopardize the continued existence of the Peregrine Falcon." No comment is made on the quotation from the first DEIS: "(it) pulls its eggs or chicks off a cliff in an involuntary clutching startle reaction." Nor is a further quotation from the DEIS commented upon: "...there is no conclusive evidence which indicates...an adverse impact on the reproductive/fledging success of the Peregrine Falcon." There is also no conclusive evidence that it does NOT have an adverse impact, altho circumstantial evidence from the June 1978 test does point that way. Are 50/50 odds good enough to risk on a known endangered species? 83
3. Page iv, para 3: Noise levels are normally less than that at busy commercial airports..." Sonic booms, however, are not made at commercial airports!
- 84 4. Page iv, para 5: "Damage...would primarily involve claims for window breakage." Large windows and patio glass doors represent not only a difficulty of replacement since the nearest suppliers and services are 200 miles away in El Paso, but also a definite human hazard in the event of breakage...will the claims cover injury as well as high cost of replacement and labor and travel? 84
- 85 5. Page iv, para 5: "A 1977 evaluation on an adobe house in Southern Arizona indicated the structure reacted similarly to conventional style structures." We'll meet this adobe structure frequently in this DEIS, but never learning its age or condition making it an invalid comparison to adobe structures in the Valentine MOA some of which are 80 years old. Comparing one structure to hundreds of varying age and condition is no comparison at all. See #85 for a full explanation of this "test". 85
- 86 6. Page iv, penult. para: "Possible impact to archeological sites in the Valentine MOA was evaluated in July 1981 and the study concludes that sonic booms are unlikely to cause significant damage." Further quotation from page 3-25, first full paragraph: "Ten (flights)... produced 2 sonic booms. Results...demonstrated that 86



there will be no impact to archeological sites..." Two booms? A 1-day supply? THIS is a demonstration of "no impact?" Why not a month's supply of 750 booms? How can just 2 booms predict what 200 - or 2000 - will eventually do?

7. Page v, 1st full para: "The potential for sonic boom impact on the local economy has been evaluated and determined not to be significant." See Critique "B" of the Economic Impact Study for refutation of this.

8. Page 1-6, 1.2.1.: "Airspace locations greater than 150NM from Holloman are not considered viable alternatives." See #43, #45, #46 and #47 below for refutations of this.

87 9. Page 1-6, 1.2.1: "...the 49th TFW relocated the originally proposed boundary because of a potential impact upon the McDonald Observatory." Proposals and surveys with a view to installing equipment and/or the planned new 300-inch telescope on Mt Livermore would bring McDonald facilities 12 miles closer to the Eastern boundary of the MOA. 87

10. Page 1-8, 3rd para: "No window damage was reported." Damage was found in a home some time later when owners returned to vacation there. It went unclaimed because resident felt it would be too difficult to prove.

88 11. Page 1-8, 1.2.4: The cited "area visitations, speaking engagements, town meetings and press releases" are largely myths. The residents and their committee learned nothing from April 1978 until August 1978 when a meeting was announced. At none of those meetings or in none of those press releases or in the DEIS were the residents informed until one of November 15 '78 stated the area was to be invaded with subsonic activity the following Monday, the 20th! This was the first word that anything other than supersonic activity had been intended. 88

12. Pages 1-8, 9: "...there is a low probability that on the average, an individual would hear more than 2 to 3 sonic booms per day." If true, this is 60 to 90 sudden, explosive slaps on an unsuspecting sunburned back a month; 720 to 960 a year!

89 However, an additional annoying fact nowhere addressed in this DEIS is the effect of afterburner detonation which has been likened to a sonic boom by its makers and hearers. The numbers of these should also be predicted in order to determine ultimate "stress" impact. 89

13. Page 1-9, 1st para: "If supersonic operations are not conducted in the Reserve area...use of the Valentine area may then increase... to (double) the supersonic training sorties." Daily booms would then be 6 or more per individual: 120 to 180 per month, about FIFTEEN to TWENTY THOUSAND A YEAR! Heartless!

14. Page 1-12, 1.6.1: Aside from the airfields mentioned, there are many private airstrips on ranches thruout the area.

90 15. Page 1-15, 1.8.1(1): "In accordance with FAA policy, the designation of the area as a Military Operations Area was circularized for public review and comment before being established." No notice was given to the Commissioner's Courts of the Counties, no newspaper publication of the proposal, no public meetings were held. It is puzzling, bewildering and a mystery to the residents how this designation, so important to their lives, could have been established with so few knowing about it. 90

91 16. Page 1-17, 1.8.2: There are 2 towns within the Southern flying ellipse which are not acknowledged: Candelaria and Ruidosa. Further, flights outside these ellipses, through pilot error or overenthusiasm in pursuing a foe could impinge on Marfa (pop. 2466), just 5 miles from the MOA border; Van Horn (2772), 10 miles from the border; Kent, also 10 miles from the border; Presidio and Ojinaga, Mexico (5200 and 13000 respectively) just 15 miles from the Southern border. Also, no mention is made of the many Mexican ejidos and settlements, ranches and farms along the Rio Grande in Mexico. 91

The above population figures are 1980 census, correcting the AF figures in the DEIS...Also instead of 213, Valentine's 1983 census is 340.

Thus, the total area both to-be-impacted and possibly-to-be-impacted carries a population of approximately 22,000!

17. Page 1-19, 1.8.4(2): In addition to the farming noted, vineyard activity is also increasing with further expansion and a winery envisioned.

92 18. Page 1-19, 1.8.4.(3): "One of the area's important economic resources" (NOT 'recreational activities', as stated) is (leasing for) big-game hunting" (of local wild life and stocked exotic big game animals.) It cannot continue to be so when either hunter or his prey are startled by an unexpected sonic boom, afterburner shock or other jet noise. Leasing, therefore is expected to be impacted markedly should this activity be implemented. 92

93 19. Page 1-19, 1.8.4.(3): Leasing, as stated, is approximately \$350,000; the other \$650,000 is made up of sales of fuel, food, beverages, auto tires, parts, batteries and service, taxidermy and other hunt expenses. 93

94 20. Page 1-21, list: As reported to the AF in the Critique (G-129) of Sept 4, 1979 this list is defective. It was not corrected and the same errors appear. For Example, the Gulf Coast is 3000 lots, not 300; Green Valley is 2560 lots, not 256. Also, on Jun 9, 1980 the AF was notified of the platting of Last Frontier Ranches in that same area, with 125 homesites and 200 more planned. This was not included in the present DEIS. Also, 2 new developments have been created and sold since 1980: Warbonnet I across from Bloys Campmeeting and Warbonnet II across from Apache Pines, totalling about 50 lots (350 ac) and all sold, some with homes, others readying. 94

Other corrections: There are now more than 50 full-time families in the DMR, up from 35. Apache Pines: almost all lots are now sold.

Further, the AF took no note of statement made at the meeting (G-26): "At Crow's Nest there is a camping ground that is made up of at least 30 campsites" (and 2 cabins). Capt. Smith: "Yes, ma'am. As you may know, we received this information from the people in the area and we'll be glad to include it in." It is NOT "included in" the list on Page 1-21, despite the assurance.

To sum up, the total number of lots (approx. 7700) could represent a potential additional population in the MOA of 15,000 even if all were only childless couples. This projection, supplied the AF in the Critique (G-129) is not considered in this DEIS. Will booms prevent this potential, with great loss to the developers and the community?

Also, the map on Page 1-22 should be corrected to reflect: #8 Warbonnet II, #9 Crow's Nest Campground, #10 Warbonnet I and #11 Last Frontier Ranches.

21. Page 1-23, 1st para: Bloys Campmeeting, in addition to an Assembly Hall, contains more than 350 structures and many permanent trailers.

22. Page 1-23, 2nd para: "No complaints have been received...." Since Green Valley is a sales organization, it is to their interest to soft-pedal the imminence of sonic booms overhead; this, coupled with the remoteness of the area and the obvious preference of its present residents to keep it that way would account for the silence on the part of either sellers or residents.

23. Page 1-23, 2nd para: "No other real estate interests have been identified beneath the remaining portions of the area." See Comment #20 regarding information supplied the AF in June 1980 for inclusion in this DEIS as well as the Crow's Nest Campground discussion in #20. As noted, the 2 Warbonnets should be included.

24. Page 2-1, 2.o.2: "There are no known local government policies on land use relative to the proposed action." Texas counties have no ordinance powers; hence, there can be no land use policies either in favor of or opposed to the action. There is County Court opposition to use of its airspace as an Aerial Battlefield, as reflected in a resolution which was to be reproduced herein but was not.

25. Page 2-1, 2.1: Statements regarding lack of economic impact (Page v and others) are certainly at variance with "The representatives of the DMRA have expressed concern regarding the possibility that property values, tourism and the quality of life in that area will decline if supersonic training is approved."

26. Page 2-1, 2.2: "...No supersonic flights will be authorized within a 5NM radius of the town of Valentine." Since the boundary of the Northern ellipse will be 5 miles from Valentine and since a boom can have a dimension of 18x24 miles, it appears the AF is playing dice

with Valentine. "By careful selection of these reference points the 49 TFW can confine THE BULK (not all?) within areas having the least number of people.

Great confining! Even during that all-important showcase test period (June 1978) they couldn't avoid dropping 2 reported booms right onto Valentine! And on April 24, 1980 they boomed a window in the Valentine High School, endangering students when it fell! How many will start the flattening process of Valentine when they go to 750-1500 a month?

98 | 27. Page 3-2, 3.2.2: The CDNL equation uses a 24 hour, 365-day base (8760 hours) where a 12-hour, 5-day week (3120 hours) is more appropriate for a limited activity (page 1-5). This is confirmed by the author of the equation who, in correspondence with the CPWTF agrees the figure should be increased by 3 dB to account for the 12 hour activity. Further calculation adds another 1-1/2 dB for 5-day activity, not 7. | 98

28. Page 3-8, last para: "...An individual living in the center of the ellipse should average hearing 2 booms on any given day." That is, 50 to 120 (given no Reserve activity) a month, 600 to 1200 a year...year after year after year! How great for the 14+ people in the Northern ellipse and the half-dozen in the Southern one (Page 3-17). Right there will be 20+ highly annoyed people, not just the projected 6!

29. Page 3-14, last para: "It seems prudent....an attempt should be made to obtain more critical evidence (of effect of sonic booms on health)." THIS IS JUST WHAT WE'VE BEEN TRYING TO TELL THE AIR FORCE FOR FIVE YEARS!!!

A former Surgeon General of the U.S. said, "Calling noise a nuisance is like calling smog an inconvenience. Noise must be considered a hazard to the health of people everywhere."

A study of noise-affected children proved just that: Cohen, Krantz, Evans and Stokols at the LA International Airport found significantly higher blood pressure in them with greater difficulty in solving math and other mental problems.

99 | At Amsterdam's Schiphol Airport, residents near a new runway in a previously quiet area doubled their purchases of anti-depressant drugs due to the great increases in low back pain, spastic colon, stomach trouble, allergies, ringing in the ears, dizziness and headache...all of which are psychosomatic problems caused by noise-caused tension. It was concluded that aircraft-noise-caused hypertension led to atherosclerosis and cerebrovascular accident or heart attack. | 99

100 | The Navy has now commissioned such a study by Woodward-Clyde Consultants of Walnut Creek, Calif. It would be prudent that all activities now be halted until that study is completed and its findings applied! | 100

30. Page 3-15, 3-16: The studies cited to not discuss the impact of perpetual sonic booms upon the same subjects year after year; see #28.

31. Page 3-16, 3rd para: The Oklahoma City Study cited declared that "the reaction was that 27% were "highly annoyed" (G-131), refuting the ultimate deduction (Page iii herein) that only 6 out of 700 (less than 1%) of Valentine MOA residents would be "highly annoyed." 27% of 700 is 189 highly annoyed. A St Louis test by the AF showed that 35% were annoyed by only 3psf booms; thus even the modest 35% of 700 would amount to 245 "highly annoyed" in Valentine, not just 6. The Reserve DEIS states on Page 4-15 that of 150 White Sands MOA residents, 13 to 20% are "highly annoyed."

The "social survey conducted near an Army Base" cited revealed that from 40% to 68% were "highly annoyed" by cannon firing at 24-hour levels ranging, not from the 63.9 (should now be 66.9...see Comment #27) dB levels promised the Valentine MOA, but levels ranging only from 7.1 to 33.9 dB (Source: Report #4439, Dr Wm. Galloway, Recommendations for Revision of Valentine Environmental Impact Statement)

32. Page 3-16, para 4: "The number of people that would be highly annoyed by sonic booms is a function of the CDNL produced by the booms." It is obvious that asking people if they're highly annoyed doesn't give the answer the AF is looking for—consequently, an equation is set up (as given on Page D-11) which will give a total for the AF presentation of "six people within the Valentine MOA (who) would be highly annoyed and may complain about ("complain about?"..Why not "object to?" )the noise.

33. Page 3-17, Table 7: The figures are incorrect. In the light of Statement #27 the CDNL numbers should be increased by 4-1/2 dB, changing the ellipses to 62.5, 58.5 and 48.5 respectively - and, referring to Page D-11, 3rd para., would change the percentages to 17, 10 and 2 respectively; changing the "highly annoyed" to 2.38, 2.50, 0.02, 1.02, 2.60 and 1. respectively for a total of 5 in each ellipse, not 3. The total of 10, then, is an increase of almost 70% from the projected 6. Obviously, even with this change the number is still ridiculous because it is based on an artificial premise that doesn't match asking the people themselves if they are "highly annoyed" by sonic booms.

34. Page 3-18, last para: "Effects on horses: Occasional jumping, galloping." See G-52, 53 for the hazards to horsemen on rocks, cliffs, etc.

35. Page 3-25, 3.2.4.1: Presidio is 15 miles, not 50 miles from the border of the MOA. See Comment 16 above.

36. Page 3-28, lead and 4th para: See Critique "B" of Economic Impact Study for a refutation of this specious argument that sonic booms did not affect the incomes of the 4 control MOAS.

37. Page 3-28, 3.2.4.2.5: Fort Davis has only 3 eating places. There has been a loss of 2, not a gain of 3.

- 105 | 38. Page 3-29, 4th para: Crow's Nest, Apache Pines and Warbonnets I and II are not, as stated, "experiencing relatively little activity but have, on the contrary, sold almost all their available lots. They are on Hwy 166, not 118 as stated and are not south of the Davis Mountains as stated. | 105
39. Page 3-29, penult para: "Land values in the 4 control MOAs have been increasing." Since private land in them ranges from 20% to 0%, it is obvious that a very limited supply of land for sales should increase its value regardless of booms. This does not hold true for the Valentine MOA which is 100% private land; it's an apple to orange comparison.
40. Page 3-29, 5th para: "No significant impact is expected in the Valentine MOA." Pure sophistry! Since there are no booms at present, prospective buyers do not know of the problem, nor are landsellers about to inform them of the coming undesirability of the land. That is why there is "no evidence that sonic booms are having a deleterious effect on land values."
41. Page 4-6, 1st para: "... (R)erouting will result in increased flight times and increased fuel costs for the commercial carriers." If only the AF had as much concern for us! This cost burden is far less than that to be sustained by the residents of the Valentine MOA.
42. Page 4-6, 2nd para: As cited (Comment #16, above) Valentine's impactable population, given accidents, is closer to 20,000 than 700... 10 times larger than that of Pecos' cited 2000.
- 106 | 43. Page 4-7, (8): Valentine 1983 population is 340, not 213 as stated. | 106
- 107 | 44. Page 4-10, 4.2.1.3 (1): A Florida location is better suited to overseas deployment to Europe, Central America, the Mideast, Africa. | 107
45. Page 4-10, 4.2.1.3 (1): It is difficult to conceive that an enemy would be inclined to attack 70,000 square miles of desert land, making it necessary to station F-15s to defend it. Since missiles are already aimed at Holloman it would be unnecessary for enemy fighter planes to spend 2 weeks flying to attack when a present missile will do it better in 15 mins.
46. Page 4-10, 4.2.1.3 (3): Training should be more effective if conducted in all weather than by "(Holloman's) cited good year-round flying weather below 2000 feet and 3 miles visibility." Or have the enemy agreed with the TFW that future fighting will only be done between them and us on clear sunny days?
- 108 | 47. Page 4-11: The cost comparison between Valentine and Tyndall is grossly misleading. At a cost per sortie of \$5,146.88, 3600 Tyndall sorties would cost \$18, 528,768... an increase of \$5,802.768 more than Valentine for the same number, not the \$16,920,024 indicated. Further, since 250 miles of flight per plane would be saved, or at least 1000 miles per sortie, 5760 sorties would save 5,760,000 flight miles - more than enough in fuel savings to pay the additional cost!!! | 108

48. Page 4-12: It is suggested the Corpus Christi Naval Station facility be considered since the Navy is no longer using it and the Army, using only a part of it, is responsible for maintenance of the full facilities.

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49. Page 4-13, para 2: As stated (44) a Tyndall location would improve deployment to Europe, Central America, the Mideast, Africa.

50. Page 44, last para: The "adverse effect on the morale of Air Force personnel" who, by the very nature of their employment have agreed to and expect to be deployed to places not necessarily of their choice for short periods cannot be compared to the adverse effect of the Aerial Battlefield upon the morale of people who CANNOT move away and who are expected to absorb its effects, not for just 60 days, but for YEARS...people who feel they are being imposed upon by an unfeeling military machine which takes over their airspace without compensation or consideration of the fact that 95% of them are opposed to that usurpation.

51. Page 4-14, para 1: "Deployed operations...(would result) in an increased noise impact on populated areas near the base." Again, this is a condition of military life...a part of the expected duty reflected in what they do for a living. It certainly is NOT a part of civilian life in the Valentine MOA and especially since it is not something they are getting paid to endure but is, instead, a sacrifice both monetarily and in life quality they are being forced to make against their will.

52. Page 4-14, 4.2.2: "Mexican constitutional restrictions do not allow foreign military aircraft over Mexico." Does it allow foreign military aircraft to drop sonic booms onto Mexico?

53. Page 4-14, 4.3: It would appear that maintaining the 49th TFW at Holloman is now the basic error that should be rectified by total removal elsewhere so continued growth will not be hindered by human or environmental concerns, since it is apparently so circumscribed by other required AF activity in its vicinity that it is becoming ruthless toward people in order to achieve its goals.

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A bold move now without the flimsy excuse that it is defending 70,000 miles of desert would perhaps find it a home with unlimited opportunities for growth and flexible deployment; this could at once improve its activities and purpose and eliminate contention, discord, delay and cost.

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54. Page 4-17, 1st para: "Currently there are about 150 people living under the (White Sands Missile Range) supersonic airspace with between 20 to 30 people being highly annoyed." The reasoning the AF presents for the Valentine DEIS is that less than 1% should be highly annoyed - that is, only 6 "complainers" (AF jargon, AF pejorative). But by the very figures they've collected in White Sands (one of the 4 Control MOAS they cite) not 1% but 20% of Valentine's affected 700 should be highly annoyed.. ONE HUNDRED FC {TY, NOT SIX. Why don't they reconcile their phony equation with reality?

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55. Page 4-18, para 4: If 750 booms a month result in a person hearing from 2 to 3 a day, doubling it to 1500 will not result in a 4 to 5 a day result, but 4 to 6 a day. The AF makes difficult equations easy, easy ones hard!
56. Page 4-18, last of para 4: "The resultant noise levels would still be...compatible with EPA and HUD criteria." Not so! Adding the 3dB suggested by Dr Galloway would bring it above those criteria.
57. Page 4-18, last para: After a test which dropped a mere 2 booms on archeological sites, it is only logical that 4 would do no more damage (?) Can this truly and fairly be correlated with 750 to 1500 booms a month and still bring forth a valid conclusion?
58. Page 4-19, para 3: "Area expansion to the east is limited by McDonald Observatory." The potential use of Mt Livermore previously cited indicates an eastward restriction of 12 miles and may constrict the MOA into uselessness. The annoying, therefore, of more people would seem to indicate the Valentine MOA an illogical choice to begin with.
59. Page 5-1, last para: Again, "6" people are cited as being annoyed in the face of the AF's own tests, ranging from 20% to 35% (50% outside Edwards AFB) showing that instead of 6, from 140 to 350 should be highly annoyed...which is proved more true by the 95% opposition to the entire project by all the residents of the MOA and its environs.
60. Page 5-1, penult sentence: "The anticipated noise level is less than the 65 dB established by HUD..." Incorrect. The equation  $15 \times 5 \times .08 = 8.6$  should, for a 5-day operation, be  $15 \times 5 \times .08 = 12$  which adds another 1.5 dB to the following equation on Page D-33  $L_{cdn} = 104.0 + 10 \log_{10} 8.6 = 49.4 + 63.9$  dB. Dr. Galloway says a 12-hour operation adds 3 dB and since the 5-day operation adds 1.5 dB the final total is not 63.9 dB, but 68.9 dB, well OVER the accepted HUD and EPA levels acceptable and still without taking into account the peak powers that are the basis problem in sonic booms. While a foot in boiling water and one in ice water will average out to be comfortable, this theory won't work in human terms.
- The statement that the highest level will be 58 dB is incorrect; a minimum of 4-1/2 dB must be added to any stated maxima thruout this DEIS.
61. Page 5-1, last para: Again, afterburner detonation has not been addressed as the annoying factor it is...almost on a par with a sonic boom.
62. Page 5-2, 5.3.2: "No supersonic flights within a 5NM radius of Valentine." See #26 for the meaninglessness of this declaration.
63. Page 5-3, 5.3.4: It is difficult to believe claims will be adjudicated fairly or completely when the AF's own references show that from 1959 to 1970 they paid only \$1.7 million in structural damage claims out of \$3.6 million...a paltry 6% (G-141, D-14); \$128,000 against claims of \$900,000 for animal damage (14%); \$21,500 for chickens, horses and cattle out of \$144,000 claimed...6.7%, and \$100,000 out of \$610,000 claimed for mink damage (Sorry, we've no mink here other than those hanging



in clothes closets. But we'd be better off having mink (17% paid) than horses and cattle (6.7%); unless the booms - cause the hair to fall out of the mink in the closets.

If tank damage or calving problems occur from sonic booms, look forward to \$67 reimbursement for every \$1000 animal destroyed.

Further, the F A A's tests in Oklahoma City showed minor unreimbursed home repairs increased 60% during the 6-month test period... and while the AF keeps citing all the favorable aspects of this test, they never mention this revealing fact which is in the records, too!

64. Page 5-3, penult. para: "Payments for property damage are most often based on the repair cost of the item damage or the depreciated replacement cost, WHICHEVER IS LESS." This is totally unfair when considering the age of structures in the MOA...when a cracked window which is totally serviceable or an aged structure which is adequate to its use are destroyed or damaged by a sonic boom - and which, without booms, could have still been useful and serviceable for years to come, would be reimbursed for at the LESSER of its cost or replacement at its depreciated value (what is the depreciated value of a 50 or 75 year- old structure or window pane?)

119 65. Page 5-4, last para: "Sonic boom claims for damage may be denied for one of two reasons:.....(2) The damage resulted from other causes; for example, structural deficiencies...in some cases, partial payment is made on a claim, although the sonic boom was not the only cause of the damage, it was a contributing factor. An apportionment is made proportionate to the damages caused by the sonic boom versus the other causes." This implies that so-called and AF-determined "structural deficiencies" will limit the amount paid and since there is no structure in the Valentine MOA ever built to FHA or VA standards since time began, all will have "structural deficiencies", and will thus, ipso facto, be denied full reimbursement for damage claims. 119

66. Page 5-1, 6.0: "The area, remotely located and sparsely populated, is considered by some as the "last unspoiled frontier." (By the strangest of coincidences, the Reserve area is described with exactly those same 3 poetic words!!) Since this is agreed is it now necessary that it, too must finally be despoiled? Must this last unspoiled area be taken over by an Aerial Battlefield because it is so unfortunate as to be situated within "150NM of Holloman AFB?"

120 67. Page 6-1, 2nd para. As previously cited, 3 new subdivisions have been created, platted and sold and others are in the planning stages. 120

68. Page 6-1, 3rd para: Regarding this statement about economic impact, See Critique "B" of the Economic Impact Study.

69. Page 6-1, 4th para: The assurance that "pilots normally conduct flights well inside the .... boundaries of the area" cannot be trusted. Since November 20, 1978 when the so-called "subsonic flights only" commenced, SUPERsonic activity created 20 booms per year being reported OUTSIDE the Eastern boundary of the MOA which would indicate an equal number, at least, at various other points in the MOA;

probably 75 to 100 a year overall. All booms were reported as heard to both Holloman and the Washington Air Force Office, as well as to Senators and Congressmen.

70. Page 8-1, 3rd para: "Areas...should be locally available so that costly ...alternatives...would not be required." There are no costs greater than human suffering, frustration and impositions of damage with unasked-for changes in a way of life. As demonstrated (Comment #47) actual savings will result from a move to Tyndall, shortening training time since more than 50% more sorties can be flown there and the savings in fuel to and from flight area would be more than offset by losses, degradation of life, potential health damage which the AF admits requires more study (Page 3-14) and frustration with the action of a "Big Brother" whose usurpation of this airspace despite resident opposition and protest creates a distrust of all officialdom and militarism.

71. Page 9-1, 4th para: Copies of the petitions mentioned were requested by the 49th TFW, together with typed copies of the names for inclusion in this document. The promise of inclusion was not kept...no copies of the petitions grace this document. 121

72. Page 9-1, 5th para: The Jeff Davis County resolution as well as those of 3 City Councils and the Brewster County resolution, all opposing the activity, were promised to be reproduced in this document...another AF promise unkept....this document contains none of those copies. 122

73. Page 9-2, 9.2.1: It must be considered when discussing water tank damage that most of the large rock type are from 50 to 75 years old and would probably be ruled "structurally deficient" by AF standards. Yet, with patching and refurbishing they remain serviceable enough to supply cattle in remote areas with the needed 25 gallons per head. Damage to a tank, undiscovered for a week, would result in disastrous water loss and dehydration death of an entire herd before being discovered. Does the AF actually intend to insure 100% reimbursement for both cattle and tank, even if the tank be discounted for "structural deficiencies?" Or would reimbursement for cattle be on the 6.9% basis? (Comment #63) 123

74. Page 11-8, #96: See Critique "B" of the Economic Impact Study.

75. Page B-6, 2nd para: "Area Resident Response." Note that a resident of the town of Valentine reported 3 booms...despite the AF promise that Valentine would be avoided by 5 miles. So much for promises!

"A total of 18 different sonic booms were reported by area residents." Note that "it was learned that more than 18 other sonic booms were heard but NOT reported via the questionnaire (Page 1-8, first paragraph)." Additionally, how many more were heard and not reported either way?

Also note: (G-139): The Marfa Airport had 1000 questionnaires in an unopened box under a table and 10 days after arrival they were still there, still unopened and well-hidden, although a table displayed all kinds of "help-yourself" material. No one knew of their existence or their location until a requester helped seek them out. Why were the questionnaires hidden in an airport at Marfa, 30 miles away OUTSIDE OF THE MOA ITSELF instead of being available right there in Valentine???? 124

76. Page B-7, last para: "The McKinney residence....has yet to submit a claim...To date, only one of the above two alleged claims has been submitted." The claim was reactivated by the new owners and again disallowed by the AF with the specious statement that: "The plaster would have cracked anyway."
77. Page B-8, c: Window damage of several magnitudes were reported to the CPWTF but no claims ensued because it was felt they were minor and/or too much trouble to go through with.
78. Page B-9, h: See previous reason (Comment #75, 3rd para) why response was "minimal;" that is, questionnaires were 30 miles away.
79. Page D-8: "Oklahoma City." Of 3,000 adults, 37% "felt like complaining" and "12% did." It can be assumed, then, that 37% of the 3,000 were annoyed (1,110) and that 12% (360) were highly annoyed. How does the AF reconcile this finding with their supposition that only 6 out of 700 in Valentine will be "highly annoyed" by sonic booms? Are the people of Valentine less sensitive and caring, or will 78 of the 84 (12% of 700) be away from home during the daylight boom-time hours?  
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"At the end of the test, 73% of the total group felt they could learn to live with 8 booms a day...." Which means that 27%, or 1,110 could not! And that would translate to 189 in Valentine, not 6!
80. Page D-9, 1st para: "Complainers were more often middle-aged females." In this context, "complainers" is more pejorative than informative since one who files a complaint is not necessarily a "complainer" in the commonly accepted sense of the word. However, the AF much prefers to call objectors or critics of their actions "complainers" or "hostile".
81. Page D-9: "Edwards AFB." Here, where sonic booms are matter-of-course and a part of military life, 27% of the residents of the base itself found daily booms unacceptable! And 50% of the residents of nearby communities where military payrolls are important found them unacceptable! This makes the claim of only 6 in Valentine even more ludicrous, since it is not a military base nor will it benefit from a military payroll.
82. Page D-10, last para: (See #27) This calculation is in error, based upon Dr Galloway's statement that 3 dB should be added for a 12-hour operation instead of 24; also, 1.5 dB should be added for 5-day operations.  
126  
126
83. Page D-12: "Oklahoma City": It is interesting to note the AF does not cite the equally important finding that the test caused a rise of 60% in unreimbursed minor damages to homes.
84. Page D-4, indent: It is verifiable that very few structures in the MOA are "in good repair" since the area contains only old structures, both living quarters and work buildings, and while suitable and adequate to their present uses, are being put to unnecessary, uncalled-for and unwanted risk by infliction of sonic booms upon them. Neither the resources

exist to repair damage nor the knowledge of how to make proper claim (many of the residents are deprived, disadvantaged, uninformed and part of a minority); nor is anyone certain the AF will make full restitution in light of its statements it will pay on depreciated costs...a record of a

85. Page D-14, result, para: "One additional investigation is worthy of mention - In 1977 an adobe house in southern Arizona was instrumented and evaluated while supersonic training was taking place overhead." Here's that adobe house again and it proves to be indeed "worthy of mention"!!!! Let us examine this paragon of criteria - this test par excellence which the Air Force cites so frequently as to make it stand as their "Handy-Dandy Guide to What Happens to Sonic-Boomed Adobe Structures."!

In 1977 in the Sells MOA, an adobe home belonging to one John <sup>Harris</sup> ~~Smith~~, an attorney for the Papago Indian Tribe was instrumented for trial. In attendance were Capt. Gauntt, Lt. Col. D. Johnson and Dr. C Nixon. The following are direct quotations from the transcript of the public meeting held there at the Sells MOA on 27 March, 1979:

"Capt. Gauntt: ....I was responsible for that team coming out here last December. We were very disappointed with the results. The fact is we only got one good sonic boom that we recorded, a substantial sonic boom. We did hear two or three other minor ones, but they were not of sufficient overpressures for us to get any good readings on."

"Lt. Col Johnson: Well, there is one other thing that we tried to gain with this team that came out here, and the question was, was adobe structures any more sensitive than normal construction? Unfortunately, with just one sonic boom, you really can't make a positive statement."

So now we know. ONE boom will NOT demolish an adobe home. We can sleep comfortably. Knowing that the FIRST boom won't do it, no matter what its construction, because the paragraph goes on to say "there should be no difference in the probability of damage to an adobe or conventional structure." We can't vouch, however, for what will happen when the second boom arrives - or the hundredth - or the thousandth. But... NEITHER CAN THE AIR FORCE!

86. Page D-15, last para: "Scratched or nicked glass is not as strong as properly installed new glass." Thus, old or nicked or cracked glass, still serviceable, is now put at risk by AF activity, causing cost of travel to distant towns, annoyance and tenuous adjudication for something not AF-considered "structurally sound;" in the case of large windows or glass patio doors not only problems greater and travel for replacement or service farther (El Paso, 200 miles), but risk of injury is excessive.

87. Page D-17, last 2 paras: As previously noted and here again cited, the AF paid: 14% on animal claims, 6.96% on chickens, horses and cattle. Apparently unscrupulous Americans were unabashedly trying to bilk the AF of \$144,000 they claimed for chicken, horse and cattle losses...the vigilant AF was able to halt this fraud by talking them out of \$122,500, paying out only \$21500. Similarly they were able to save \$800,000 of \$900,000 claimed for damage to other animals. They did their best job of stopping unscrupulous victims who claimed \$30.6 million in structural

damage by paying these crooks only \$1.7 million, ...just 5.5% of what they filed for.

128 88. Page D-18:- "Reindeer" While admitting that reindeer do not adapt to sterile, the AF conveniently, for their own purposes, overlooks the conclusions of the report which are: 1) It was inconclusive because done during their "quiet time of year"; that is, no stresses due to gestation, calving or feeding; 2) the Lapps do not corral their reindeer during thunderstorms since they would panic and stampede, nor do they during sonic boom-making periods; 3) It stated that sonic booms could have negative influences on their reproduction. In sum, the authors admit the test is totally flawed because of the time it was done, yet draw conclusions from even that which would indicate ill effects on the reindeer; yet the AF blithely states they never even got up on their feet!

90. Pages D-30, 32; Figs.4,5: Note occurrences of out-of-bounds flight.

91. Page D-33: "In the Valentine test": Again the AF does not cite the 18 additional known but un reported booms as well as others heard but not reported, giving the false impression that of 205 booms only 18 were reported, therefore only 18 were heard.

129 92. Page D-34, last para: Monotonously, again unfair 24-hour weighting is used; all numbers must be raised 3 dB to account for actual 12-hour use. 129

130 93. Page F-5: Tyndall costs: Tyndall sorties' costs are less than \$6 million more than Valentine's; moreover, training time overall is shortened by more than 50% because of more sorties per year being possible. (See Comment #46 for more complete analysis of savings) Also, as a result, Reserve activity could be halved or, with slight expansion of WSMR, also eliminated together with Valentine. Another alternative..consideration of Corpus Christi Naval Air Station (Comment #48). 130

94. Page G-137, first para: Contrary to assurances by the then Commander of the 49th TFW citizen opposition apparently carries no weight.

95. Page G-137, 3rd para: Contrary to assurances by the AF, the map showing locations of objectors and their land comprising 95% of the affected territory was NOT published in this document.

**SUMMARY:** Comparison of this Critique with that furnished the AF concerning errors in the first DEIS reveals no attention was paid to eliminate many of the errors are repeated in this 'Revised' DEIS. We recommend another revision which does not selectively hide facts and publish half-truths (the Reindeer Fairy Tale, the Arizona Adobe House Myth, the CDNL Syllogism and others) or, better yet, abandon the entire Valentine MOA!

## SUPPLEMENT #1

to

## CRITIQUE "A"

AIR FORCE STATEMENT...Page 3-22, 3.2.3.3, 4th para: "One additional investigation is worthy of mention. In 1977 an adobe house in Southern Arizona was instrumented and evaluated while supersonic training was taking place overhead. The conclusion of the evaluation was that the adobe structure reacted similar to a conventional style structure. Based on this analysis, there should be no difference in the probability of damage to an adobe structure as compared to a conventional structure."

AIR FORCE MEETING: 6-7 Aug 1980 at Langley AFB; present, Dr. Bill Galloway, (Bolt, Beranek & Newman), Maj W A Gauntt, Mr Tom Lord, Mr Al Chavis: Preliminary review of Valentine EIS concluded: "no major technical errors."

AIR FORCE MEETING: Sells Arizona, 27 March, 1979:

Capt. Gauntt: "I was responsible for that team coming out here last December. We were very disappointed with the results.

The fact is we got only one good sonic boom that we recorded, a substantial sonic boom. We did hear two or three other minor ones, but they were not of sufficient overpressures for us to get any good readings on."

Lt Col Johnson: "Unfortunately, with just one sonic boom, you really can't make a positive statement....it appears that adobe structure is not super-sensitive from what we would have seen from that one exposure."

CPWTF CONCLUSION: Apparently this is not considered a "major technical error" since it was not corrected from the first DEIS where this same conclusion is made. Apparently Dr Galloway was not advised at the meeting of August 1980 that the effects on adobe structures was based on just ONE solitary sonic boom.

131 | ONE sonic boom is not a valid statistical basis for determining the effects of 9000 or 18000 sonic booms a year on adobe structures (See Supplement 2, attached). (Also see Supplement 3, attached). | 131

Positive assertions based on faulty data make all other positive assertions in this DEIS suspect.

SUPPLEMENT # 2 to CRITIQUE "A"

AIR FORCE STATEMENT...Page 3-22, 3.2.3.3, 4th para: "The conclusion of the evaluation was that the adobe structure reacted similar to a conventional style structure."

AIR FORCE LETTER 19 March 1980: "The Engineer found that the cracking on the interior walls and a ceiling of the McKinney residence was caused by a combination of natural forces acting upon the structure and obsolete construction practices....it has been deemed appropriate to deny this claim."

CLAIMANT'S LETTER 15 May 1980: "'Actual witnesses, who were present and actually saw the walls and ceiling crack at the EXACT TIME of the....sonic boom CERTAINLY meet the requirements that prove the 'existence of a causal connection between an authorized noncombat activity and the damage claimed.'"

AIR FORCE LETTER 1 April 1981: "Claim approved in the amount of \$250. The engineer...indicates that the cracks were preexisting and had been patched prior to the boom. The sonic booms allegedly reopened these cracks. Unless the cause of the original cracks is eliminated they will reappear. The foundation settlement of your house and the type of its construction are the underlying cause of the cracks in both interior and exterior walls. The cracking around doors and windows is typical of aging adobe houses. Another common practice of past years was construction of footing which were too shallow, making the building susceptible to settling as a result of temperature extremes and moisture content of the soil. The footings of your house appear to be 6 inches deep; 12 is minimum recommended depth."

CLAIMANT'S LETTER 15 May 1980: "Concrete, Rock and Well-Maintained Rastered Adobe houses are deemed the proper structure for this area...the State-owner facility, the Indian Lodge, (is) constructed of Adobe. Adobe houses dominate this area, and these structures have been standing for many years without destruction or being harmed by "natural forces."

AIR FORCE RESPONSE 15 May, 1981 (1 year after appeal, 2 years after first appeal: Remittance of \$250.00 against claim of \$600...41%.

CPWTF CONCLUSION: It was obvious from the claim that the point at issue was th damage caused to recently-repaired cracks by a sonic boom. If it is the intention of the Air Force to disclaim damage to adobe buildings constructed with the methods of the past, all adobe homes in the area are at risk because their very age indicates they were constructed with "the methods of the past." Adobe houses are always being refurbished, repatched, replastered and repainted because of the nature of the materials. Settlement of claims ranging from 6% to 41% are patently unfair when the Air Force has been made fully aware of the nature of the structures in the Valentine MOA they are putting at risk!

## SUPPLEMENT #3

to

## CRITIQUE "A"

AIR FORCE STATEMENT...Page 1-8, 3rd para: "Two alleged property damage claims were directly attributed by residents to test booms. One involved structural damage to a house and water tank located east of Valentine, and the resident submitted a damage claim in 1980."

CPWTF STATEMENT: The preceding Supplement, #2, deals with this claim, its comments, the appeal and the settling of the claim.

CPWTF QUESTION: Why did the Air Force not deal further with this claim in the DEIS?

CPWTF CONCLUSION: The Air Force did not want to admit that a single sonic boom caused visible and extensive damage to an adobe structure; the Air Force did not want to publish the fact that it disallowed a claim on the basis of "structural deficiencies" because it was fully aware that practically all structures in the Valentine MOA have 'structural deficiencies' and that public knowledge that they had damaged and refused to pay for that damage would hurt their case; that the Air Force is fully aware that practically all structures, because of their age, are at risk and that their claim that they are all structurally deficient would, by their standards, absolve them of all financial responsibility when damage is caused by sonic booming.

Further, the Air Force did not want to reveal the extent of the claim (\$600, not counting the damaged water tank) and the amount they settled for (\$250.00...41.67%); further, they did not want to reveal that it took 2 full years for this claim to finally be adjudicated, after a refusal and an appeal against that refusal; further, they did not want to reveal that it took a full year after the appeal before the check in partial settlement was received.



SUPPLEMENT #4  
to  
CRITIQUE "A"

AIR FORCE STATEMENT, Page B-7, 3rd & 4th paras: "The engineer's evaluation of the McKinney residence concluded that 'The cause of the damage is a combination of natural forces acting upon the structural and obsolete construction practices.'"

Further: "The McKinney residence...has yet to submit a claim against the Air Force."

THE FACTS: This is the second statement in which the Air Force disguises the facts that a claim was made...that it was denied....and that upon appeal it was finally granted, in part; that is, a settlement of \$250 against a full claim of \$600.

Supplement 3 fully details this entire transaction.

132 CPWTF CONCLUSION: It is inescapable that the Air Force is not inclined to give all the facts concerning any of their supersonic activity when it suits them to conceal them, making suspect not only this, but all other positive statements until others, partial or impartial, are permitted to research all their references, all their bibliographies and to question all the authorities whom they so glibly but, apparently, selectively quote. 132

SUPPLEMENT # 5

to

CRITIQUE "A"

AIR FORCE STATEMENT...Page D-18, Reindeer: "A study of reindeer reaction to sonic booms revealed that at low levels of over-pressure (0.3 to 0.5psf) the animals react with temporary muscle contraction and minimal or undetectable interruption of activities. Higher levels (up to 10.5psf) cause them to raise their heads, look around and sniff but never produced a reaction strong enough to bring resting animals to the feet. Panic movements were not observed, but neither was adaption to startle noted."

FURTHER STATEMENTS FROM REPORT OF WHICH THE ABOVE IS ONLY A PART: "It must be underlined, however, that the observations from the present equipment apply to a relatively small group of animals under special environmental conditions and that some other effects could be expected under other conditions.

"It is thus possible that a bigger congregation of reindeer (at slaughter, marking, etc. several hundred animals are usually concentrated in corrals of the size used in this study [one acre] ) could display serious panic reactions to sudden and intense disturbances. This is a well-known phenomenon to most Lapps, who avoid keeping large herds in corrals during thunderstorms. The reason for the increased panic risk in large groups is the increased probability that single animals will display more intense reactions than other animals and in consequence of the well-developed allelomimetic behavior in reindeer, such deviating reactions tend to spread very quickly.....

"It is also important to underline that the period during which the .... study was made represents a relatively calm and uneventful time in the year-cycle of the reindeer. Thus, important reproductive factors such as rut, gestation, care of calves were practically non-existent during the test period. By experience it is known that reindeer during gestation, in particular during the later phase and during the calving season, are very sensitive to most disturbances.

"Thus, it cannot be excluded that disturbances caused by supersonic could have some negative influences on reproduction in reindeer."

CPWTF CONCLUSION: By selectively drawing a single favorable statement from this report, the Air Force has covered up the true import of the test as revealed in the above further quotations therefrom: 1) that the test was flawed because done at an unmeaningful time of the

"reindeer year"; that if it is intended to show what will happen to American livestock instead of Laplander livestock, it betrays a threat to their reproduction and, because of possible panic stampede when confined within a corral for branding, shipping, disinfecting or other reason, it contains a threat to each other as well as to the cattlemen working in the corral with them.

Further, the last of the last sentence quoted from the Air Force statement, that "adaption (sic) to startle (was not) noted" indicates without doubt that hoofed animals do not get used to startle effects, such as sonic booms, with repeated frequency of them.

This immediately portends the risk of cattlemen in any herd situation <sup>in or out of 2 Corra</sup> where the possibility of stampede, caused by an unexpected and unpredicted sonic boom can throw a rider from a horse, putting him in hazard when herding since the boom will startle both cattle and mount; it will endanger a rider on a canyon rim or rocky ground; it will endanger the animals themselves as they react in panic.

SUPPLEMENT #6

10

CRITIQUE "A"

AIR FORCE STATEMENT: Page 9-2, 9.2.1, para 2: "....a sonic boom-from an F-15 at Mach 1.4 and 10000 ft(AGL) would produce an overpressure of 5.19 psf. For a worst case situation....could be as much as 20-26 psf. The loads produced by sonic booms are equivalent to the loads caused by a change in water level of about five inches."

THE FACTS: The AF does not state which of the two overpressures cited would be equal to five inches. With the Air Force propensity always to present the best side, we must then assume that the five inches of water represent the lower of the two overpressures cited; namely, 5.19 psf.

If this is so, in the McKinney water tank, which is 100 feet in diameter and 13 feet deep at one end, 8 feet at the other and is situated on a rise above the residence cited in the previous Supplements, 5 inches of water translates as follows:

100' diameter tank equals 7854 square feet equals 1,130,976 cubic inches x 5 inches depth equals 5,654,880 cubic inches of water divided by 231 cu.in. per gallon equals 24,480 gallons ~~multiplied by~~ times 8.33 lbs per gallon equals 203,918 pounds divided by 2000 equals 102 TONS of weight thrown into that 60-year-old rock tank in a one-second impulse!

For a 50' diameter tank, the impulsive instantaneous weight increase is almost 25 TONS!

The above figures assume the best case presentation by the Air Force; that is, about 5 inches, or approximately 1 inch per foot of overpressure. Other things being equal, the mass effect in a worst case boom of 20-25 psf would then translate to a weight of 500-TONS being instantaneously and impulsively thrown into the tank...10 boxcars!

CPWTF CONCLUSION: A casual statement that 'a weight equivalent to about 5 inches of water' without translating that 'five inches' into meaningful figures is another example of the Air Force gloss-overs in this DEIS intended to obfuscate, NOT enlighten.

8 Aug 83

CRITIQUE "B" of the ECONOMIC IMPACT STUDY Dated May 1980

Before proceeding to a page-by-page, paragraph-by-paragraph examination of the Air Force's Economic Impact Study as it relates to the VALENTINE MOA, it will be sufficient to point out the broad statistical criteria which separate the "apples" of the 4 Control MOAs (White Sands, Gladden, Sells and Desert, Nevada) from the "orange" of Valentine.

First and foremost are that the ownership and economies of 3 differ from the other two while the 4th differs from the first 3 and the 5th, to wit:

White Sands with an area of 5000 miles of 100% public land but only 150 affected residents is economically lumped in with a \$200 million economy of cities and towns not affected by booms.

Gladden, with 85% public lands has its minimal population economically lumped in with Phoenix's and Prescott's \$20 billion annual economy, almost none affected by sonic booms.

Sells' 7100 square miles are primarily poor Papago Indian Reservation, but their limited economy is lumped in with Tucson's \$5 billion one..and Tucson is not sonic-boomed.

Desert is 99% public land and most of it is strafed, bombed, and otherwise militarily harassed, so there's not much economy to speak of, altho the \$15 million economy of Lincoln County is brought into the picture to explain how there's no economic effect of booming on an area that has only 1% private ownership.

All these apples are compared to the orange of Valentine which has NO public land and NO big city economies to disrupt the picture. Consequently, the only true economic numbers in this statement are Valentine's.... the others are so immensely distorted by those of the unboomed larger cities that it is obvious booming a limited population private lands can have no measurable effect on those economies.

Another class of evidence of the distortions that result in comparing these apples with this orange as follows:

In White Sands, an outside population of near 20,000 and 400 business establishments was extrapolated to tell what the economic impact is on just 150 people - a ratio of 120 to 1.

For Gladden, it was 1,700,000 people, 12,000 business establishments, on fewer than 1000 people - a ratio of 1700 to 1!

For Sells we could find no population figures, but when Pima County's 500,000 population and 3700 business establishments is compared

to not more than 7000 Papagos and their handful of mom-and-pop stores and gas stations, the ratio must be near 70 to 1.

Thus, the economy of 1700 people was declared to show the economic impact on each person in Gladden - 120 people on each one in White Sands - 70 people in Sells to each Papago Indian.

BUT....in Valentine the ratio is far different: a population of the included area of 6300 projected against an affected population of 700 gives a ratio of only 9 to 1...and an economy of not multi-millions or billions, but a mere \$31 million.

As with any social "science" such as economic impact, no solid "law" can result from extrapolation from such disparities - any businessman knows that better than any theorist. Only conjecture can result and our conjectures as as good as any theorist's....and with practical experience to back it up, perhaps more so!

Having now dealt with the general in showing how the apples of White Sands, Gladden, Selis and Desert cannot be used to predict the impact on the economy of the Valentine MOA, we shall now deal with the specifics of this study as they pertain to Valentine in particular, drawing attention to fallacies, misinformation, misinterpretations, incomplete and false conclusions, etc., citing page, paragraph and line:

- 135 | 1. Page 206, 1.3.1: "Area....designed to avoid populated areas..." Since booms at 51,000 feet travel 20 miles outward, that can affect Valentine (340), Van Horn (2772), Marfa (2466), Presidio (5200), Ojinaga (13000) and the rest of the area (1500) - a total of more than 25,000 impactable people! | 135
2. Page 207, 1.3.3: "The AF...investigated each claim...." and responded to one by saying, "The plaster would have cracked in the course of time anyway." (!) What would they have said if the house had been knocked down.. "It would have fallen down some time"?
3. Page 208, 1.5 end of para 2, middle of para 3: The AF no longer uses the excuse of overflying Mach 1 because of watching speedometers. Apparently technology caught up with them as we suggested in 1980.
4. Page 209, 1st sentence: "Nothing is foreseen in the next 5 years which would change the present....scheduling policy." We don't trust this; we fear: 1. Night flights. 2. Night booming. 3. Doubled scheduling, despite Reserve. 4. Additional types of aircraft. 5. Newer, faster, noisier aircraft.
- 136 | 5. Page 209, 1.6.1: 1980 population of Valentine, 320; 1983, 340. | 136

- 137 | 6. Page 210, 2nd para: 1-20 should be 1-10. | 137
7. Page 212, 1.6.5.3: As stated to the researcher hunting income is above \$1 millions. Lease income is approximately \$300,000 as stated; balance from fuel, tires, parts, repairs, food, beverages, ammunition, butchering, cold storage, taxidermy, lodging, licenses, etc. benefiting the towns of Fort Davis, Marfa, Alpine, Van Horn.
- 138 | 8. Page 213, 1st para: Crow's Nest and Apache Pines are on Hwy. 166, not "118" as stated and southwest, not "south" 2 new developments are now also there, comprising 350 acres, all sold. | 138
9. Page 213: "No evidence of activity (at Green Valley or Gulf Coast) was observed from the highway." Had the researcher driven the half mile down the road he would have found out why....boomed people prefer to sell, not build! Booming is discouraging development (is this the AF long-range plan?)
10. Page 213, last para: Bloys Campmeeting contains 350 structures and many permanent trailers.
11. Page 214, Table: Corrections and additions: DMR, 50+ full time. Apache Pines, all lots sold but 2; Green Valley, 2560 lots, not 256. Gulf Coast, 3000 lots, not 300. Add: #8, Warbonnet II (25 lots); #7, Last Frontier Ranches (325 lots); #9, Warbonnet I; Crow's Nest Campground (30 spaces, 4 cabins); #11 Bloys Campmeeting, 350 buildings, trailers.
12. Page 216, 1st para: Incorrect; Jeff Davis County population gained.  
2nd para: Incorrect: Valentine gained 13.86% to 320.  
4th para: Incorrect: Presidio County increased over the 1977-78 estimates.  
5th para: Incorrect: Marfa's population stabilized. | 139
- 139 | 6th para: The above, and corrections to following tables indicate the falsity of reliance upon these projections; and as more property is subdivided for retirees it is obvious this growth will accelerate - unless the MOA and its booms stop it!
13. Page 217 - Table V-2: Correct figures are as follows, consecutively  
14,228,383    3.95    1650    0.012    0.5    320    19.413
14. Page 218, Table V-3:  
14,228,383    3.95    5200    0.04    2yr, 11.54    2466
15. Page 219, Table V-4:  
14,228,383                    1650    0.012    +5.0    5200    0.0365    +4.2

16. Pages 220/226: This already dismal picture certainly, by the most dreamy-eyed projections, cannot be improved by sonic boom-bardment! Or is it the hoped-for conclusion of the AF to so force abandonment of the area for their own future purposes?

17. Page 228, 1st para: Incorrect. Courthouse records show a decline, not an increase, in eating places in Jeff Davis County.

2nd para: Incorrect. There have always been 2 building materials stores in Fort Davis.

2nd para: Incorrect. Decline in food stores in Jeff Davis County is not "because new and larger units may have been added" but because reduced gas costs enable shopping in Alpine for larger variety and lower prices.

18. Page 229, 1st para: Presidio growth reflected the growth of Ojinaga, across the river in Mexico which supplied a substantial part of Presidio's economy until shattered by the recent peso devaluations,

19. Page 239, para 2.9: Incorrect and self-contradictory. 2 very large farms, a vineyard and a large pecan orchard exist near Valentine; onions and cantaloupes are farmed near Presidio, 2 vineyards flank Blue Mountain on Hwy 166. Also contradicted by p 3.2.9 on Page 246. "Farming lacks importance"?????

20. Page 240, 1st para: Incorrect. As previously stated, Jeff Davis and Presidio Counties show a population increase.

21. Page 242, 3.2.6: Incorrect; more than 50 permanent homes in the DMF

22. Page 243, 3.2.7.2: Incorrect; McDonald is not a mere "planetarium." but a full-fledged, hard-working, world-renowned multi-telescope OBSERVATORY!

23. Page 244, 3.2.7.2: In reality, the boundary line is no respecter of booms...they have been experienced at the Visitor Center and Telescope Complex.

24. Page 244, 3.2.7.4: Incorrect. 40-80 Sonic Booms a day will discourage hunters and other visitors since it will no longer be the tranquil, ,pristine area they now come to use and enjoy, besides driving out retirees and others, thus affecting restaurants, grocers, service stations and other suppliers to an enormous degree.

25. Page 244, 3.2.7.4: Incorrect. The loop road is 74 miles and traverses Texas Hwys 166, 17 and 118. To counter the claim herein that "there can be no evidence...that this...drive will be...affected by the sonic boom activity!" is sophistry at its worst. There can be no evidence until after it occurs..and then it will be too late!



- 144 | 26. Page 245, C.Hunting: "During the ... testing period, no impact on animals was noticed." This fully unsupported statement is ridiculous! WHEN did WHO observe WHAT animals WHERE? And for all of 15 days? What kind of observable impact on calving, nesting, fledging, feeding, galloping, rushing and other affectable animal activity could a mere 15 days of observation (if any!) prove? | 144
- 145 | 27. Page 245, 3.2.8: Incorrect. By the report's own statements there are many more than a mere "3000 irrigated acres of cropland in Jeff Davis County." | 145
- 146 | 28. Page 245, 3.2.8: A Fort Davis realtor estimates a decline of at least \$10 per acre in value...a property value loss of \$14.5 million. | 146
29. Page 246, 1st para: Many rock tanks are over 75 years old. The concerns regarding damage and reimbursement therefor are real, as the AF states only replacement or depreciated value, the lower, can be considered. The AF record of 6% claims payment is not encouraging since no structures in the MOA are up to AF standards.
30. Page 246, 3.2.9 Farming: Again, other farming operations are not taken note of...see Comments #19 and #27 above.
- 147 | 31. Page 247, #2: Proper spelling is "Calderon"  
#8: Proper spelling is "Gearhart"  
#17: Proper spelling is "Scudday" | 147

#### + C O N C L U S I O N +

The Council for the Preservation of the West Texas Frontier concludes, from the differences in the report with actuality and the manifold errors therein, pointed out by the above corrections, emendations, additions and delineations that the number thereof can lead only to the conclusion that there is sufficient error throughout the report as to make its findings totally suspect, entirely untrustworthy and completely immaterial and without value.

COUNCIL for the PRESERVATION of the WEST TEXAS FRONTIER

Box 400 Fort Davis TX 79734 915-426-3414

29 Oct 83

Hq TAC  
(DEEV)  
Langley AFB VA 23665

We are attaching herewith for inclusion in the EIS objections to the activity from:

Brewster County Commissioners Court  
Jeff Davis County Commissioners Court  
Alpine City Council  
Alpine Chamber of Commerce  
Balmorhea City Council  
Fort Davis Chamber of Commerce

We are also enclosing herewith for inclusion in the EIS:

Editorial and Reader letter from El Paso Herald-Post Oct 17 1983  
Alpine Avalanche article and reader letter Oct 13 and 27 1983  
El Paso Herald-Post article Oct 11 1983  
El Paso Times article Oct 9 1983  
El Paso Times article Oct 12 1983  
El Paso Times article Oct 9 1983  
San Angelo Standard article Oct 11 1983  
El Paso Herald-Post article Oct 12 1983

We are also enclosing herewith for inclusion in the EIS:

Questions and Comments from Richard Barga, MD  
Letter from E M Nix Jr

We are also enclosing herewith for inclusion in the EIS:

Copy of letter of opposition from the Fort Davis Historical Society

Sincerely,

  
RW Dgt, Coordinator  
C P W T F

County Auditors and that Judge Earney is required to approve and appoint the Auditor. Judge Earney has stated in the past that he preferred the Court make a recommendation before he makes an appointment.

Mr. R. W. Voigt from Fort Davis appeared before the Court to request a Resolution opposing a plan of the U.S. Air Force to designate this area for a battle field with their planes. The objections concern the super sonic blasts from the planes and the damage to property and animals in this area. Commissioner Salmon stated that he had no objections to the plan of the Air Force because they had to have an area to practice and be prepared to defend the United States in case of an attack. Mr. Voigt stated, with documented evidence, that the Air Force had alternate locations for these maneuvers where there were no residents, such as California and Nevada. Motion to approve a Resolution opposing the plan of the Air Force was made by Commissioner Ivey and seconded by Commissioner Ward. Judge Thomas and Commissioners Ward and Ivey voted "Yes" and Commissioners Valadez and Salmon voted "No". Motion carried.

April 10 1978

TO WHOM IT MAY CONCERN:

The Commissioner's Court of the County of Jeff Davis, State of Texas, has today passed the following RESOLUTION:

RESOLVED, that this Court, representing the citizens of this County, express its strong opposition to the Supersonic Flights which the Air Force based at Holloman AFB proposes to inflict upon us.

RESOLVED FURTHER, that this Court proposes to take all steps necessary to prevent such infliction of noise, shock, hazard and other impositions upon its citizens, their property, their animals as well as the precious wildlife of this tranquil, peaceful countryside.

Mrs. Wanda Adams  
Judge, Commissioner's Court

John Robert Prude  
Commissioner Prec. 1

W. W. McElroy, Jr.  
Commissioner Prec. 2

H. L. Kokernot, Jr.  
Commissioner Prec. 3

Ben F. Gearhart, Jr.  
Commissioner Prec. 4

CITY COUNCIL MEETING

May 2, 1978

4:00 P.M.

Present were Mayor Paul Pierce, Councilmembers Bill Sohl, Jesus Valenzuela and Paul Weyerts. Also present were Joel Nutt, Pammie Sanchez, Eva Marie Sotelo, Amelia Terrazas, Abdolaziz Zameri, Betsy Jane Reilly, George W. Rodriguez, Priscilla Salmon, Preston Chappell, Larry Joe Capps, Gainri Sametaweep, Tom Connor, R. W. Voigt, Johnny Watkins, Sandi Owens, Lovie Whitaker, John Allen, Bob Stevens and Josie Brenner.

The invocation was given by Mayor Paul Pierce.

Mayor Pierce ascertained the proof of notice of the meeting. Josie Brenner stated that the notice was posted on the 28th day of April, 1978.

Motion by Sohl, seconded by Weyerts that

RESOLUTION NO. 4473 - the Council approve the minutes of the previous meeting.  
Motion carried unanimously.

Mayor Pierce welcomed the members of Tom Connor's Municipal Government Class to the Council Meeting.

Mr. R. W. Voigt from Ft. Davis discussed reasons Fort Davis citizens are protesting the Air Force proposal to set-up an "Aerial Battlefield and Sonic Boom Target Area" in the unpopulated areas of Presidio, Jeff Davis and Culberson Counties.

Mr. Voigt stated that individuals were protesting this proposal because of the economic loss the sonic booms would create in this already low income area. Livestock would also be effected. Mr. Voigt also discussed the effect on the people of the area especially the retired people.

Mayor Pierce discussed the Air Force proposal and stated that after a trial period they were not sure if the program would continue. He noted the area that would be covered by the tests.

Dr. Weyerts noted that there had been low fliers near the surrounding ranches and that none of the ranchers had reported any damage done to their cattle.

Mayor Pierce asked who would determine if the effect on the livestock in the area was detrimental or not.

Mr. Voigt stated that the sonic booms would aggravate the structures of buildings but that no studies had been made on the effects sonic booms would have on adobe. The main concern of the individuals protesting the proposal was the effect the sonic booms would have on human beings.

Discussion was held as to why another area was not picked for the "battlefield." Mr. Sohl felt that since there was no monetary gain in the tests we should support the protest.

Motion by Sohl, seconded by Valenzuela that

RESOLUTION NO. 4474 - the Council go on record in support of the Ft. Davis protest against the Air Force proposal to set up an "Aerial Battlefield and Sonic Boom Target Area." Discussion. Motion carried unanimously.

## ALPINE CHAMBER OF COMMERCE

### POSITION STATEMENT

The Alpine Chamber of Commerce is strongly opposed to the creation of the "Aerial Battlefield and Sonic Boom Target Area" the Air Force plans in our neighboring counties.

The Alpine Chamber has in excess of 200 business and professional members from Brewster County.

The Chamber is vitally interested in the tourist development of this area with the objective of providing enjoyment for the majority of the people without undue adverse impact on what nature has provided.

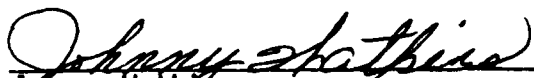
The proposed skirmishes will:

1. Cause serious economic loss to our area.
2. Seriously affect livestock production, the foundation of our economy.
3. Cause an ill effect on our wildlife which is an important visitor attraction.
4. Cause property values to lower.
5. Destroy our most valued asset-peace and tranquility.

Based on these reasons, The Alpine Chamber of Commerce Board of Directors unanimously voted to stand firmly against the proposed procedures.

Signed 11 day of May, 1978

  
Ray Morrison, President

  
Johnny Watkins  
Executive Vice-President

# CITY OF BALMORHEA

Phone 375-2307

Box 323

BALMORHEA, TEXAS 79718

## RESOLUTION 62

A RESOLUTION PROTESTING A PROPOSED MILITARY OPERATION AREA IN HUDSPETH, CULBERSON, JEFF DAVIS, AND PRESIDIO COUNTIES.

WHEREAS, we have been informed that it is the intention of the Department of the Air Force to designate portions of these four counties as a Military Operations Area, and

WHEREAS, the City of Balmorhea is near enough to the vicinity of the proposed area that it's citizens, properties, livestock, wildlife, and economy will be effected, and

WHEREAS, we have experienced indiscriminate sonic booms and damage from these sonic booms on many occasions in the past,

NOW THEREFORE, be it resolved by the City Council of the City of Balmorhea Texas, that we are opposed to any Military Operations Area in this area even on a temporary, trial basis.

  
Helen K. Humphries, Mayor

  
Councilman

  
Councilman

  
Councilman

  
Councilman

  
Councilman

ATTEST:

  
City Secretary

Fort Davis Chamber of Commerce  
Box 378  
Fort Davis, Texas 79734

May 4, 1978

The Honorable

Washington, D. C.

Dear

I have been asked by the membership of the Fort Davis Chamber of Commerce to write to you expressing opposition to the proposed super sonic jet training area that is proposed in West Texas over Valentine and near Fort Davis.

This training area, if allowed, will have a very detrimental effect on the portion of the state under it as well as on the peripheral countryside. At speeds above Mach 1, how can spill over be avoided? We have studied similar proposals and believe the disturbance to our lifestyle as well as the possibility of physical damage to structures is not justified. Certainly we are concerned about the defense of the U. S., however, we believe that suitable alternatives do exist.

Thank you for your consideration of this matter and your efforts in our behalf.

Sincerely,

President  
Fort Davis Chamber of Commerce



C O P Y

Ft Davis Historical Society  
Overland Trail Museum  
Ft Davis TX 79734

Mr Richard C White  
House of Representatives  
Washington DC 20515

Dear Sir:

The Fort Davis Historical Society has voted to oppose the establishment of any air combat maneuvering range (identified as the Van Horn Supersonic Area) in West Texas.

Our Society was founded in order to preserve and encourage interest in the history of Fort Davis and the surrounding area. We maintain the Overland Trail Museum which is open to the public and in which we have displayed memorabilia relative to the area history.

Our area has been called the "last remaining frontier." Much of the area remains much as it must have appeared to the first white men who traveled the Davis Mountains <sup>and</sup> to the Indians before their coming. Supersonic jet flights will certainly destroy this frontier image.

At the edge of our town the U S Government has established a National Historic Site at old Fort Davis and has restored the Fort much as it must have been in the 1880s. Our Society was active in having the Fort made a National Historic Site. It is a popular tourist attraction which helps acquaint many citizens of our own country and even of foreign nations with authentic history of the area in the last half of the 19th Century.

On entering the Fort one has the feeling of stepping back in time to those earlier days. Would not supersonic jets with those sonic booms destroy this atmosphere?

Is it not important that this little spot of frontier be preserved that future generations may experience first hand what it must have felt like to have lived in those earlier times?

Ft Davis Historical Society

(signed) Jerry Stone, Secy

Oct  
17  
1985



Give light and the people will find their own way.

# El Paso Herald-Post

The Newspaper That Serves Its Readers

Harry Moskos, Editor

Jay Ambrose  
Managing  
Editor

Tim Gallagher  
City  
Editor

Angela Hogue  
Editorial Page  
Editor

Mills Avenue and Kansas Street, El Paso, Texas 79999 (915) 546-6365

## Grins and grimaces

**H**ere's a look at what went right and what went wrong in El Paso last week.

### Grimaces

IT WAS A totally unsatisfactory meeting. Residents of the village Valentine, Texas, met with representatives of the U.S. Air Force last week. The Air Force spokesmen were to explain how proposed super sonic test flights over the small adobe town will affect people and livestock in the area.

But the Air Force panel of seven officers and two civilians didn't provide many answers, and some Valentine residents charged the Air Force had sabotaged a report on the sonic booms they expect to be hearing soon.

Before this plan is put in action, the Air Force should come up with a better explanation of what the town can expect from the proposed 300 flights a month that will be made over the Valentine area.

## Letters

### Poorly prepared

**EDITOR:** I attended the Valentine Air Force meeting last Tuesday and I can only say that if the Air Force is as poorly prepared to fight as it was to answer questions, we're in bad shape!

Many pointed questions were asked about the impact statement. The steady reply was, "There is no one here who can answer that, it will have to be answered in the final impact statement."

This was an obvious Air Force ruse, since, by the time it happens, it will be too late. As a retired blue-suiter, it left me ashamed of my former service. — Ed Morris, Kort Davis.

El Paso H.P. ☐ Oct 22 1985

**WHILE AWAITING** word on whether they will be allowed to fly supersonic sorties over Valentine, military pilots are flying their missions over White Sands National Monument, adjacent to the White Sands Missile Range.

But park rangers at the monument are alarmed over the potential dangers to human health and structural damage to the monument. So they have consulted Richard Worthington, the UT El Paso biologist who is serving as an expert witness for the Valentine residents, to find out what kind of dangers exist. The Air Force is averaging 20 to 30 booms per day over the monument, and according to Worthington, "It may have no effect at all, but it may have affect the dune patterns at the monument."

Ralph Voigt, speaking for the citizen's group opposing the booms, asked the Air Force for copies of all reference materials since so many errors have been found in the most recent Environmental Impact Statement, a revision of a previous statement. Local opponents to the Air Force argued that the original statement was also flawed in many places which caused the revised statement, the

subject of the hearing Tuesday.

Key issues raised Tuesday included the fact that the Air Force used a study on Swedish reindeer to say that the booms would have no affect on deer, antelope, and cattle. Left out of that statement was the facts found by opposition citizens group that the Laplanders in Sweden do not herd reindeer even in thunderstorms because of fear of stampede. The few booms over the reindeer were recorded at a time the reindeer were "quiet and in a corral."

The Air Force statement also altered decibel readings to comply with the government's maximum levels for noise, the citizens pointed out.

Dr. Richard Worthington, a UT El Paso professor said he was appalled that the Air Force had not used any current studies on the effects of sonic booms on humans, that the most current studies on many subjects have been omitted from the statement, that no flight surgeons or engineers were included in the parade of officers brought before residents.

The citizens group also asked about the Air Force's basis for saying in the statement that adobe houses would not be harmed by booms. Voigt showed that "study" con-

sisted of one boom on one house in Arizona and quoted the two men in charge of that study as saying the results were inconclusive.

The Air Force offered no answers or rebuttal to any of the charges or questions lending credence to the belief that the public hearing was little more than a dog and pony show required by federal regulations and not designed to gauge the feelings of those persons living under the proposed boom target.

In Voigt's conclusive remarks, after about three hour of discussion, he asked that the environmental statement be re-drafted, that something be answered on the questions raised about the affect of booms on animals and humans, that the proposal be stopped until a study now underway by the U.S. Navy to determine the affects of sonic booms on humans is completed and that all descriptions of housing in the area including proposed developments be placed in the statement since it had been omitted.

He also asked that Worthington's statements and studies on sonic booms and human reactions and other health related information on booms be included in the statement. That information was included in a similar statement prepared for Reserve, N.M., which is also fighting the booms proposed for that area. It was not included in the Valentine statement although that is the area for which Worthington wrote the findings.

Voigt also said the petitions, maps, and resolutions by city and county governing bodies were omitted from the statement.

The petition was a result of the comment by

the then-colonel at Holloman AFB, N.M., from where the flights will originate. That officer said four years ago that if it could be shown that the people of the area were opposed to the booms, they would not begin. A petition with about 95 percent of the names of those living in the area was presented, but the Air Force has since reneged on that statement.

Col. Kenneth Ratcliff, legal counsel for the 3rd Military District, presided over the meeting, which was much more orderly than previous hearings. He said at the outset of the meeting he would "allow the residents to ask questions if not inappropriate" but not to make statements until the close of the meeting. At the close of the meeting he said written comments about the proposal must be postmarked no later than Nov. 4 and mailed to HQ TAC-

DEEV, Langley AFB, Virginia 23665.

A final decision on the proposal will be made by a civilian in the Secretary of the Air Force's office.

Legal counsel for the citizens group fighting the proposal was present at the meeting and does plan suits to block the plan if verbal and written opposition by the residents does not.

The best line of the night came after the meeting. Kimball Miller of Fort Davis, a ranch owner in the Valentine area and a former airline pilot for many years, said the matter was not one of patriotism. "We realize these kinds of test flights have to be made. We're not anti-Air Force, but there's a right place to do it and a wrong place. There's a kitchen and a living room and a bedroom and a bathroom. The Air Force is trying to go to the bathroom in the middle of the living room."

PAGE 4-A, ALPINE [TEX] AVALANCHE, OCT. 27, 1983

## LETTERS

Editor, The Alpine Avalanche:

After reading your excellent article of Oct. 13 regarding the impending arrival of sonic booms and bombers, I found myself in a state of shock. Surely a boom of economic nature would be welcomed by all; however, such a series of sonic booms should be banished to that torrid stratum of the universe which rhymes with hell. Having spent a number of deafening years under the jet stream, both in El Paso and in San Diego, Calif., I find West Texas to be astonishingly, blissfully quiet. Absent are the homey drones of chain saws, dirt bikes, logging trucks, emergency sirens . . . and jet planes, so common to our (sic) civilization. I was equally amazed to learn of a public hearing in which the counsel for the aggressor decides which arguments are/are not appropriate and declines to accept statements until after the close of the meeting.

One wonders where? In the men's room? The parking lot? One also wonders just how long we are going to continue to allow the military mind (also sic) to run our society? Three cheers for Kimball Miller. But . . . has the carpet cleaner been invented which is strong enough to get the Air Force out of the living room rug?

Yours for hearing impairment,  
Margot Fraser,  
Sedona, Ariz.

# Professor to dispute Air Force claim

By Robert Palomares  
El Paso Herald-Post

It's being billed as a war of words between a UT El Paso professor and the U.S. Air Force who today will publicly dispute whether jets will be allowed to create sonic booms over the quiet Valentine, Texas, ranching community.

Richard Worthington said he plans to rebut Air Force statements that sonic booms do not harm humans and will present his case during a confrontation between the biology professor and spokesmen for the Air Force at a crowded public hearing at Valentine High School at 7 p.m. today.

The Air Force is proposing that its F-15s fly 300 supersonic sorties or military operations over the Valentine

area, saying that "no definitive stance on physiological ill-health can be made at this time."

However, Worthington says, the Air Force's Environmental Impact Statement, which was prepared to justify the introduction of these flights in the area, "is written in a way that can cause the public to draw false conclusions. Its generalizations and wordings don't represent facts accurately."

Worthington said the Air Force contradicted its own findings, and in preparing its report they "overlooked numerous studies," which indicate that health is affected by sudden noises and sonic booms in particular.

"In reading the Air Force Environmental Impact Statement, I can come

to only two conclusions, those who put the statement together were either incompetent, or they deliberately misrepresented the facts to support their case," Worthington said.

"They are making a mockery of the environmental impact system," he said.

"I'm concerned with human health and welfare in the area, and the Air Force must take a close look at the impact on the people of the area," he said.

Worthington said that numerous studies and reports have shown "conclusively" that noise has adverse health effects on humans.

He cited a study that measured the effects of human behavior on those who live and work in noisy areas.

"Studies have discovered that those

living along the flight path of the Los Angeles International Airport have a high rate of heart attacks, suicides and high blood pressure," he said.

Also, workers in noisy factories have been linked to hypertension and extreme stress, he said.

"The Air Force says that 'because these instances cannot be proven, we're going ahead with the flyovers,'" he said.

"The link between noise and ill-health is established, and I'm confident we have a strong case to take them to court to enjoin them from making the flights," he said.

Every time a sonic boom occurs, it increases the heart rate, increases blood pressure, releases adrenaline, changes the body's metabolism and dilates the pupil of the eye, Worthing-

ton said.

Even if someone gets used to hearing the sonic booms, the body will react to them.

"The heart rate will increase. Plus, the annoyance effect — people getting mad every time they hear a boom — will cause even more damage," he said.

"I plan to critically attack the health effect section of the Air Force impact study and read all these findings into the record, but I don't expect the Air Force to give up on its plans," Worthington said. He anticipates court action on the proposal, he said.

In addition to Valentine, the Air Force is also considering sorties over Reserve, N.M., along the southwestern border of the state.

# Valentine residents shout back at officials

There's heartbreak in Valentine.

The 300 or so people who live in the quiet little town 150 miles southeast of El Paso in Jeff Davis County are threatened with loss of serenity — not to mention health — if the U.S. Air Force goes through with a proposal to fly supersonic flights in the area.

Ralph Voight, 70, who retired five years ago to the peace and calm of a 50-acre patch of land between Valentine and Fort Davis, says he's going to let fly a couple of booms of his own Tuesday when the Air Force comes to town to conduct hearings on how flying the noisy missions in the area will affect people who live there.

Voight is spearheading the fight against the supersonic flights by the Council for the Preservation of the West Texas Frontier. He says an Air Force environmental impact statement purposely has been gutted of evidence that might influence the secretary of the Air Force against approving the supersonic flights.

"We are going to state that we're going to seek an injunction until the study is done properly," he said.

Since 1978, F-15 jet fighters have been flying subsonic missions over the Valentine area. But Voight says those flights are booming when they aren't supposed to be.

conducted to determine the effect of sonic booms on human health.

The Air Force, though it has conceded that there might be some human stress created by the booms, disagrees.

"We've been flying supersonic for 30 years now, and there's no documented health effects," Lt. Col. Art Tate, public affairs officer at Holloman Air Force Base, N.M., said.

During a round of public hearings in 1978, angry residents of Valentine sent the Air Force back to redo its impact statement. The new draft is beefed up with more technological detail supporting its conclusion that the sonic booms will have little effect.

Residents have been keeping "boom lists," he said, and have reported 50 to 70 booms in the area each year since the flights began.

And Voight says the Air Force's "noisy eggs" have caused him stress.

"I never know when they are going to happen," he said.

Dr. Richard Worthington, at biologist at the University of Texas at El Paso who has been studying the effects of sonic booms, joins Voight and other critics of the Air Force in saying that supersonic flights should not be made over inhabited lands until comprehensive tests are on the environment and health.

At the 1978 hearing, Air Force representatives appealed to residents' patriotism, Voight said.

"They wrapped themselves in the flag and said how proud they were to be flying this plane," he said.

The Air Force says it chose the Valentine area for the supersonic missions because it is close to Holloman and sparsely populated. The area of Reserve, N.M., was chosen for the same reasons.

Opponents in Valentine feel the Air Force purposely chose a poor area whose residents are not likely to fight back.

"Most of the people in Valentine are Mexican-Americans who

are undernourished, ill-advised and under-educated," Voight said. "The Air Force is taking advantage of people who don't know what's about to hit them."

Most of the residents of Valentine, an old railway stop, live in old adobe houses that already have structural problems and would be subject to cracking from sonic booms, Voight said.

The Valentine flight area borders a 100-mile stretch of Mexico. The area contains the state's second-highest mountain, Mount Livermore, and a portion of the Davis Mountain Scenic Drive.

The area is home to much wildlife, including the desert bighorn sheep and the Peregrine falcon, an endangered species.

"Everyone gets on West Texas for being a great empty expanse, a wasteland. That's far from true," said John Hood, an El Paso lawyer retained by the Council for the Preservation of the West Texas Frontier.

The problem, Voight said, is that the Air Force is trying to fly more missions than it has room to do around Holloman.

Opponents say the solution is for the 49th Tactical Wing to be moved from Holloman to somewhere such as an air base in Florida, so that jets could fly supersonic missions over the Gulf of Mexico.

The only other private lands over which supersonic training missions are flown are in southern Arizona, Worthington said.

"And they are doing it over the Indians," he said.

Residents' comments at the public hearing will be forwarded to the Secretary of the Air Force. Worthington expects the secretary to approve the supersonic flights.

"The residents are going to lose the initial battle, and the Air Force is going to start up," he said. "But I think the issue will be settled in court. The lawsuits are going to make F-15s look cheap."

— Travis Brown

# Air Force defends booms

By Travis Brown  
Times staff writer

**VALENTINE** — By car and helicopter, the Air Force came to Valentine Tuesday night.

A dozen colonels, majors and civilian specialists came from as far as Virginia to hear residents ask questions about the Air Force proposal to fly 300 supersonic F-15 jet missions over the area each month.

The Air Force forgot to bring one thing — answers.

About half the questions submitted by a dozen residents went unanswered during the 2½-hour public hearing at the Valentine School auditorium.

One rancher asked what effect

sonic booms from jets would have on people's health.

Col. Kenneth Ratcliff, a military judge in charge of the hearing, responded that none of the Air Force personnel present were qualified to speak on that issue.

Dr. Richard Worthington, a biology professor from the University of Texas at El Paso, told the officers that he was "absolutely appalled" that they could not answer that question.

After the meeting Maj. John Graham, executive officer of the 49th Tactical Wing at Holloman Air Force Base near Alamogordo, N.M., explained that the officers purposely did not answer many questions because they

wanted to research their answers.

"We felt it would be better to answer some questions in writing," he said.

Questions submitted will become part of the Air Force's Environmental Impact Statement and will be forwarded to the Secretary of the Air Force to help him make a decision on whether to fly the supersonic missions.

Instead of discussing the effects of sonic booms, the Air Force officers concentrated their pitch on the needs for the training missions.

Col. Richard Stamm, director

•Please see Booms, 7A

## Booms

•Continued from 1A

of operations for the 49th Tactical Wing, told the audience how the nation's armed services had suffered from World War I through the Vietnam war because troops had not received realistic combat training.

He said the Valentine area is needed so that F-15 crews can practice realistic dogfights.

"(Before Vietnam) we were not allowed to go out and dogfight with the machines the way we needed to," said Stamm, whose helicopter was parked in the Valentine schoolyard.

The Air Force did answer some questions.

Clyde Anderson, a Valentine first-grade teacher, asked how many times a day sonic booms would disrupt his classes.

"The probability of hearing more than three booms per day here in Valentine would be minimal," said Alton Chavis, an Air Force research analyst from Langley Air Force Base in Virginia.

Anderson asked, "Can I be guaranteed that I will not have to

deal with more than three booms per day?"

Ratcliff replied, "I doubt there's anybody will make that guarantee."

When Richard Cinotto, a horse rancher, asked if the Air Force had considered moving the F-15s from Holloman, the judge in charge laughed and then Cinotto was told, "No."

Cinotto suggested the government condemn people's land, pay them for it and move them away from the test area. "The way it's presented here, if they don't get to fly here, the commies will be in our back yards tomorrow, and I think that's nonsense."

Rancher Albert Miller asked what was the relevance of a study on Swedish reindeer the Air Force used in reaching the conclusion that sonic booms would have no effect on livestock.

"It is not relevant," Chavis said. "You have no reindeer in Valentine, Texas."

Air Force officials said the supersonic flights in the Valentine area could begin as early as midspring.

Only about 50 area residents attended the meeting, compared with several hundred who attended a similar public hearing in 1978.

Ralph Voight, leader of a group opposed to the supersonic missions, said residents were encouraged not to attend the meeting.

"Most of the population decided to stay home because they feel it (the public hearing) will do no good, and we wanted to keep it short and sweet," Voight said.

Voight told the Air Force officers the residents were prepared to take their opposition to the plan to court.

The Air Force says it needs more places to fly supersonic F-15 missions from Holloman.

Because airspace over White Sands Missile Range is crowded, F-15 crews can fly only half the training missions they need to stay ready for combat, the Air Force says.

The Air Force proposes to fly 300 supersonic missions each month over the remote Valentine area, located about 150 miles southeast of El Paso.

# Loud noises

## Sonic boom plan called dangerous for Texas town

By Travis Brown  
Times staff writer

In the name of national security, the U.S. Air Force wants the residents of a sparsely settled patch of West Texas to live each day with up to five window-rattling, foundation-shaking, heart-stopping sonic booms.

The Air Force wants residents of the Valentine area, 150 miles southeast of El Paso, to sacrifice some of their peace and quiet so F-15 jet fighters from Holloman Air Force Base, near Alamogordo, N.M., can fly 300 supersonic training missions there each month. The Air Force also wants to fly training missions over Reserve, N.M.

The Air Force may be wanting residents to sacrifice something else — their health.

In an environmental impact statement, the Air Force concedes that sonic booms may cause stress in humans. The statement suggests that more study needs to be done on the effects of sonic booms.

Dr. Richard Worthington, a biology professor at the University of Texas at El Paso who has been studying the effects of sonic booms on humans, says the Air Force is ignoring evidence that the "startle effect" of booms causes stress and high blood pressure.

Worthington has been researching the effects of sonic booms since 1978, when the Air Force first proposed supersonic flights over the Valentine and Reserve areas.

Worthington said he fears the long-term effects of being exposed to the noise could be as deadly as the atomic fallout Nevada residents were unwittingly exposed to in the 1950s.

"It's not a matter of whether there will be health effects, but of how bad they will be," he said.

Stress caused by sonic booms could lead to heart attacks, cerebral hemorrhages and kidney disorders, he said. The intense sounds also cause increased production of oxytocin in pregnant women, and that induces labor, Worthington said.

"None of this is in the environmental impact statement. It's been glossed over. What they have done is ignored a lot of evidence," he said.

A public hearing on the issue is scheduled for 7 p.m. Tuesday in Valentine High School.

Despite opposition, the Air Force is pushing to begin the supersonic flights around Valentine. It also is seeking to fly 300 missions over a portion of the Gila National Forest near Reserve.

Because the airspace over White Sands Missile Range is crowded, the Air Force says,

the 49th Tactical Wing can fly only half the F-15 missions it needs to keep crews combat-ready.

County and city officials in both the Valentine and Reserve areas are opposing the flights. Catron County in New Mexico is threatening to sue the Air Force.

A sonic boom results when an aircraft flies faster than the speed of sound. The air in front of the aircraft is compressed, forming a shockwave. The boom heard is the change in pressure when air molecules are compressed and then returned to a normal state.

The Air Force estimates each supersonic mission would create an average of 2.7 sonic booms. It estimates 30 percent of those sonic booms will be felt or heard by humans on the ground. The average boom would be heard or felt in a 28-square-mile area.

One section of the Air Force's environmental impact statement says a person living in the Valentine area should not hear more than two to three sonic booms



Richard Worthington: Study "glossed over" dangers.

each day. Another section says the most a person would hear would be four or five a day.

The statement concludes that the sonic booms will have no significant impact on animal or human health, other than to be annoying. It says damage to property will mostly be broken windows.

A section of the statement titled "Considerations That Offset the Adverse Environmental Effects" says annoyances suffered by residents will be part of the price to be paid for a strong national defense.

Air Force scientists predicted that only six of the 700 persons in the Valentine area will be "highly annoyed" by the sonic booms. In Reserve, six of 650 persons will be "highly annoyed."

Worthington says the Air Force has underestimated the number of sonic booms that will be heard and the number of people that will be affected.

"One third of the people in the area will be very much annoyed by what's going on there," he said.

Also, the Air Force says if it can't fly 300 missions monthly in the Reserve area, then the number flown over Valentine will be doubled to 600. And vice versa.

Sonic booms are comparable in intensity to loud rock music, jackhammers and handgun shots. Scientific studies show that humans suffer ill-effects from sounds they aren't consciously aware of, Worthington said.

# Supersonic tests not too popular

By KEVIN NEAL  
Staff Writer

**VALENTINE** — The "Wild Blue Yonder" over far West Texas is no place for the U.S. Air Force to make supersonic flight tests in the F-15 fighter, say area residents.

Residents of Culberson, Jeff Davis and Presidio counties in far West Texas are geared up to protest a new Air Force plan to make faster-than-the-speed-of-sound F-15 flights over the area, saying sonic booms could damage homes, wells and stock tanks.

The revised flight area would extend roughly from Van Horn east to Boracho, south to Marfa, southwest to a point about 20 miles west of Presidio on the Rio Grande, and northwest along the Rio Grande, cutting back up to Van Horn.

"We won't get anything out of it if the Air Force flies over here — no money, no taxes, just a lot of noise," said Valentine Mayor Jesus Calderon. "There's a lot of government land that's vacant. I don't understand why they have to use this area," he said.

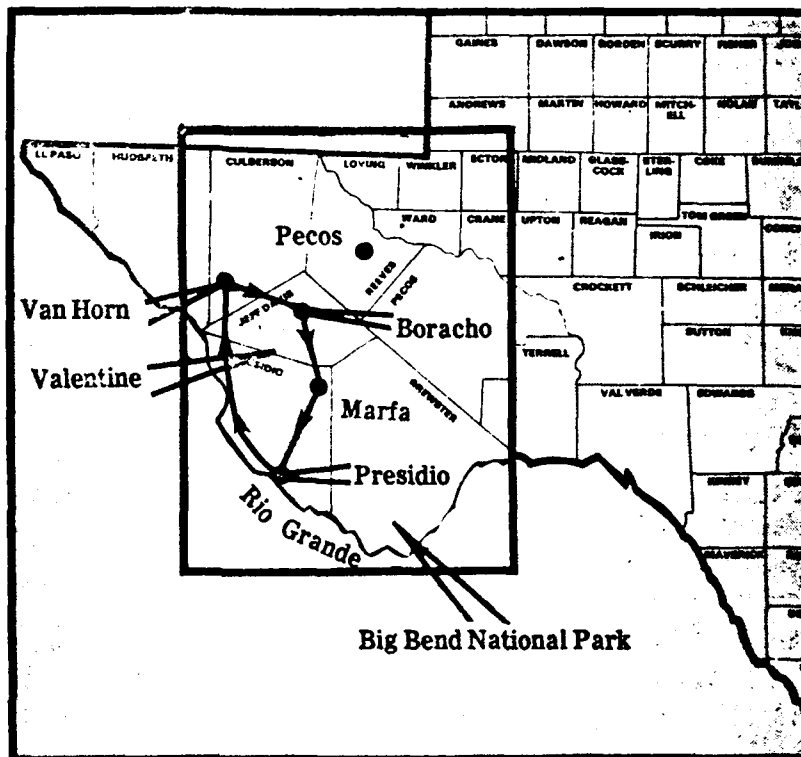
The Air Force announced its plans to begin the flight tests on Monday.

A hearing is scheduled today to discuss changes that have been made in an environmental impact statement that is necessary before the plan is approved, said Air Force spokesman Lt. Col. Art Tate of Holloman Air Force Base, near Alamogordo, N.M. The hearing will be at 7 p.m. at Valentine High School.

Ralph Voigt of Fort Davis, who has spearheaded a move to prevent the flights, said the Air Force's new environmental impact statement glosses over criticisms and concerns about the proposal.

"It either calls for another revision or it calls for a complete abandonment," Voigt said.

Voigt, who described a test flight period in 1978 as "living in a continual thunderstorm with no rain," said the group met Mon-



Standard Graphic

This map locates the approximate area to be affected by the Air Force's proposed supersonic flight tests.

day afternoon to prepare themselves for today's meeting with the Air Force officials.

He is coordinator of the 150-member Council for the Preservation of the West Texas Frontier, which will present a 95-point critique of the Air Force's environmental impact statement concerning the maneuvers and a 31-point critique of their economic impact statement at today's hearing.

The changes are in the area over which the Air Force proposes to fly 300 supersonic F-15 flights a month. The proposed flight area would avoid the McDonald Observatory, the Harvard Radio Telescope and Fort Davis National Historic Site, Tate said.

The aircraft in supersonic flight creates a sonic boom as it breaks the sound barrier. The maneuver, Tate described, "makes a shake and a boom." He

also noted that it costs about \$2,500 an hour to fly an F-15.

"There's a lot of people who are worried about this thing. It's Valentine and all the surrounding communities, too, that are worried about this," Calderon said Monday.

"There's a lot of ranchers around here who are afraid their wells and tanks are going to be damaged and some people think the walls of their houses will crack," Calderon said. "Most of the houses out here aren't built up to FmHA (Farm and Home Administration) standards; they're just adobe houses," he said.

"They (Air Force officials) are trying to convince people that it's not going to be as bad as they think it will be. But personally, I'm against it," said Calderon.

"The primary thing we were determined to do today (Monday) was to check out any cover-ups, misrepresentations or anything else the Air Force may not be telling us," Voigt said. "We want to



# Supersonic

(Continued From Page 1A)

make sure the Air Force is giving us a complete statement."

Voigt said one of the points in the Air Force statement which the committee will question is their study of the sonic boom's effects on wildlife.

"In their statement, they cite a study of the effects of the sonic boom on reindeer in Sweden, of all places," he said. "We want to know how it's going to affect our wildlife here in West Texas."

Another point the council will be refuting will be the Air Force's test of the sonic boom's effects on adobe houses. "They tested an adobe house in Arizona in 1977 but they tested it after it was subjected to only one sonic boom, so of course it didn't have any effects," Voigt said.

Voigt said previous petitions circulated in the area have shown that 95 percent of the residents are opposed to the fly-overs.

He said he is ready to take the issue to court if necessary to ask for either a temporary or permanent injunction, and in the meantime hopes to gain national publicity so the Secretary of the Air Force — who has the final say — will hear from someone other than Air Force brass.

Voigt said a lawyer from the El Paso firm of Scott and Hulse will be at the meeting to represent the council.

The Air Force first announced in March 1978 that it planned to fly training maneuvers over the Valentine area, designated as a Military Operations Area.

Following a 30-day test flight period in June 1978, area residents had a chance two months later to tell the Air Force about problems they encountered during the testing.

Tate said the site is ideal for training the 1,000 pilots who come each year to Holloman, located about 225 miles northwest of Odessa. The close proximity to Holloman, sparse population and fair weather make the location ideal, Tate said.

"We need to fly," he said, adding that the Air Force is aiming for 1,200 flights a month from Holloman.

Currently, 600 training flights are flown over White Sands, N.M., which is near Holloman. The Air Force is proposing the 300 additional flights in the Valentine area, and another 300 flights near Reserve, N.M.

No decision will be made immediately following the hearing, but the public comment, as well as written comment, will be included in a final environmental impact statement submitted to the Secretary of the Air Force for a final decision.

EL PASO HERALD POST 10/12/83



Valentine resident Ralph Voigt charges the Air Force with concealing the facts.

Herald-Post photos by John Hoppi

# Town sounds off on sonic boom

By Robert Palomares  
El Paso Herald-Post

**VALENTINE** — Residents and representatives of the village of Valentine charged the U.S. Air Force with deliberately sabotaging a report telling how sonic booms will affect their adobe homes, their cattle and their lives.

During a Tuesday night meeting the townspeople also threatened to take their cause to the courts if they don't get "just settlement" from the Air Force's proposal to begin super-sonic training flights over Valentine.

The Air Force says the training missions are vital to test the worthiness of the country's air defense system.

But the thought of nearly a dozen sonic booms a day over the small West Texas town (population 400) brought several village residents to the meeting to discuss the Air Force's report on how the flights will affect the area.

And many of the dozens of residents who came were disappointed when the Air Force panel of seven officers and two civilians only listened — and didn't provide many answers.



Col. Richard Stamm

"To the really tough questions, they didn't have any answers. Why did they bother to show up at all?" asked Ralph Voigt, president of the Council for the Preservation of the West Texas Frontier, after the meeting ended.

Voigt charged the Air Force with "incomplete compliance with the



Dr. Richard Worthington

spirit and the letter of the National Environmental Protection Act," by hopelessly confusing the issue with false information, "by concealment and incomplete presentation of all the facts."

Voigt said the Air Force report didn't tell the whole truth in the effects the booms will have on adobe

See SONIC, Page A-2

# Sonic

(Continued from Page A-1)

structures, which abound in Valentine.

The Air Force said tests on adobe structures showed no damage. "You did not disclose that the test consisted of one house, and that only one sonic boom was made," Voigt told the panel.

Col. Richard Stamm, commanding officer of the 49th Tactical Fighter Wing, which will be training in the area if the proposal is approved after the environmental impact report is finalized, said the Valentine area is needed for the training.

"We now train over White Sands Missile Range, but flights in that area is limited because of higher priority testing in that area," he said.

"We need to train at supersonic speeds so that we will be able to use the fighters as they were meant to be used — at the higher speeds," he said.

Stamm said the altitude of the aircraft taking part in the training dog fights has been raised to 15,000 feet to "minimize the sonic booms. In addition, the F-15 fighters will maintain a five-mile buffer zone from the town."

The Air Force wants to fly 300 sorties, or military operations, per month in the Valentine area.

Air Force Col. Kennet Ratcliff, who conducted the meeting, said the residents' questions "will be placed in the record of the meeting and answers will be provided in the final draft of the environmental impact report."

"How are the sonic booms going to affect the elderly with heart conditions, children, and wildlife?" asked Howard Elliott. The military didn't answer.

"This is a ranching community. What's going to be the effect on livestock?" asked Valentine resident Richard Cinotto. No answer.

"I am appalled that you failed to bring qualified people here to answer

these people's questions," said Dr. Richard Worthington, a UT El Paso biology professor who is putting together a study on the effects of sonic booms on the health of people.

"I charge you with failure to consult key studies and papers on the health affects on people," he told the panel.

"In failing to do your homework, you misrepresented facts in your report," he said. "With human health at stake, your misrepresentations are unacceptable."

"It's a shock to me that the Air Force has come in here to use humans as guinea pigs," Cinotto said.

Voigt was firmer in his statement. He charged the Air Force with rigging figures depicting the number of hours during the year that sonic booms could be heard, so it would fall within Housing and Urban Development and Environmental Protection Act acceptable ranges. However, he said, when calculated over the planned number of hours, the figure is actually above HUD and EPA standards.

"You deliberately selected the best and held back the worst" in preparing the report, Voigt charged. "And that raises a serious question. How many other statements are equally suspect of concealing pertinent and damaging facts — pertinent to us and damaging to you?" he asked.

"We have determined to take our battle to the courts so that we may be fairly heard and our rights as owners of private lands will not be boombarded away because we are so few and you are so powerful," said Voigt.

He has hired El Paso lawyers Carl Ryan and Joe Hood to look into the matter.

Residents have until Nov. 4 to submit written comments into the record before it is submitted to the office of Secretary of the Air Force for final review.

# Sonic booms draw flak in Valentine

By LAURA STONE  
Staff Writer

**VALENTINE** — Residents of this isolated area gathered Tuesday to ask the U.S. Air Force to take proposed flights, and the sonic booms they create, elsewhere — echoing sentiments expressed during similar meetings in 1978 and 1979.

Air Force representatives explained a proposal to fly F-15 aircraft at supersonic speeds above this far West Texas region, but the people who would live underneath the flights weren't impressed.

"All this exercise is a means of getting it on the record," said Richard Voigt, who organized a protest against the flights.

The final decision doesn't rest with the dozen Air Force personnel in attendance Tuesday, Voigt pointed out, warning that "we'll be addressing Washington and we're addressing the courts."

Air Force Col. Kenneth Radcliff, who sat framed by a red curtain on the Valentine school auditorium stage, explained that the hearing was an informal session.

The hearing will be part of the record to be given to the Office of the Secretary of the Air Force, where the final decision will be made. Residents have until Nov. 4 to submit written comments to the secretary's office.

None of the people who spoke at the meeting supported the Air Force's proposal.

The Air Force wants to fly as many as 300 supersonic training flights a month over the area. Many of the flights would create a sonic boom when the aircraft breaks the sound barrier.

"It seems we have no recourse," said Richard Cinotto, who ranches 13 miles north of Valentine. "I didn't volunteer for it. I wasn't asked."

He said the proposal has been presented to imply that if the Air Force doesn't get the flights, "the Commies will be here tomorrow, and that's utter nonsense."

Corinna Flippen of Valentine asked Radcliff what could be done to make the

Air Force stay away. In 1978, the community presented petitions signed by 97 percent of the property owners after Air Force personnel said that if enough people opposed the flights, they would cancel their plans.

Radcliff reminded Flippen that Tuesday's hearing was meant for comments and questions, adding that he couldn't point to anything that would change the Air Force's decision.

Flippen and Cinotto were among about 75 people who filled the small auditorium in this community, located about 180 miles southwest of Odessa. Footsteps echoed on the dull wooden floors as people came and went during the hearing.

As the hearing began, the

auditorium's west windows were filled with a view of the setting sun over the quiet mountainous West Texas ranchland that supports cattle, wildlife and about 700 people.

The land includes a military operations area, which runs along the Rio Grande on the west, skirting Van Horn on the north, near Fort Davis and Marfa on the east and missing Presidio on the south. About half the people reside in Valentine, which is at the heart of the MOA. The rest are spread out on ranches throughout the area and in the tiny communities of Candelaria and Ruidosa.

One change between the hearing Tuesday and previous ones was the smaller audience. Almost 200 attended in 1978; fewer than half that were present Tuesday.

Before the hearing began, Voigt said people had been encouraged to stay away. "Otherwise," he explained, "we get all bogged down with the same old questions."

The proposal itself also is different from the one presented five years ago.

Air Force Maj. Tom Graham said the MOA boundaries have been redrawn on the east to avoid the McDonald Observatory.

The Air Force also has agreed to fly at least 15,000 feet above sea level and not to fly supersonic flights within five miles of Valentine, Graham said.

The major said the 49th Tactical Flying Wing at Holloman Air Force Base, located about 225 miles nor-

thwest of Odessa in New Mexico, needs to fly 1,200 practice missions a month.

Currently, 600 flights are flown at White Sands Missile Range, which neighbors Holloman in New Mexico. Another 300 flights are proposed for the Reserve, N.M., area, with the remaining 300 flights to be in West Texas, he said.

"Our mission is to be able to go anywhere in the world on short notice," Graham said.

But the speakers questioned the procedure the Air Force is using to gain approval for the supersonic flights. Subsonic flights already fly over the area, which was designated an MOA in 1978.

Voigt, who read a statement later seconded by many in attendance, questioned much of the information in the environmental impact statement prepared by the Air Force.

He asked why a decibel rate

average was spread over 8,760 hours a year when flights would be flown only 3,120 hours a year.

Questions about housing damages from sonic booms and a study using effects on Swedish reindeer also were brought out by Voigt. "It will be necessary for the decision-maker to have all the facts. But he won't have them if there are more examples like the ones just mentioned," Voigt said.

Clyde Anderson, a first-grade teacher, stated his concern more simply: "How many times a day are the instructors and the people in Valentine going to have to deal with a sonic boom?"

Elton Chavez, who wrote the environmental impact statement, said the probability of hearing more than three booms a day was slight.

"Can I be guaranteed that I won't have more than three booms a day?" Anderson asked, adding, "I don't want more than my share."

QUESTIONS AND COMMENTS

regarding the

REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT

FOR SUPERSONIC FLIGHT OPERATIONS

IN THE VALENTINE (and Reserve)

MILITARY OPERATIONS AREA(s)

Submitted by:

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Due to the great similarity of the Revised Draft Environmental Impact Statements issued for proposed supersonic flight operations in Reserve and <sup>(DEIS)</sup> Gandy (NV) and Valentine Military Operating Areas, the following comments and questions are submitted for incorporation in the Final Environmental Impact Statements for both areas.

The page numbers, unless specifically noted, refer to the document entitled "Revised Draft Environmental Impact Statement....Reserve Military Operations Area, Holloman Air Force Base, New Mexico."

Due to the small amount of time available for comment on these major proposals, the following comments and questions are focused on a few critical areas of both RDEIS's.

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#### SUMMARY

148 The fact that a Revised DEIS was prepared for the Air Force's proposal indicates compliance with §1502.9(a) of the "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act". This section states, in part...."If a draft statement is so inadequate as to preclude meaningful analysis, the agency shall prepare and circulate a revised draft of the appropriate portion."

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It is appropriate to note that in this case the entire first 'draft' was revised. The present document, although extensively altered, suffers fatal flaws which render it unable, legally, scientifically and ethically, to form or represent the basis for a final environmental impact statement on the proposal. Hopefully, even though this comment is written hastily in the early morning hours, the data which will be presented, and the questions that will

be asked, will substantiate this conclusion..

Part 1502.17 of the Regulations referred to earlier, states, in part, .... "The environmental impact statement shall list the names, together with their qualifications (expertise, experience, professional disciplines), of the persons who were primarily responsible for preparing the environmental impact statement or significant background papers...Where possible the persons who are responsible for a particular analysis, including analyses in background papers, shall be identified."

149 In connection with this point we note that beginning on page 217 of the Reserve hearing, the Air Force refuses to make these names known, other than the statement by a panel member that Captain Gauntt "says he had a hand in it." Pages 218-220-----"I don't know who did that."

On page G-95 of the Valentine RDEIS the comments about the archeological expert are noteworthy. In all, there was no information provided about the persons responsible as required by 1502.17, and probably with good reason. One panel member states that he didn't feel it was necessary for the Air Force to review all the sonic boom literature (c.f. page i--"The Air Force has conducted an intensive literature review..."). As Mark Twain noted, the idea is first to get your facts, then you distort them as you desire.

The comments above, along with the major flaws in these papers, indicate that not only are these documents inadequate to serve as a basis for an EIS, but that the Air Force should take leave of it's closet experts and delegate to an independent technical group the task of producing a paper that, as NEPA requires, must be of "high scientific quality".

It is a harsh statement to say that these documents often appear to be deceptive in intent, but careful review leaves the inquiring layperson with no other conclusion. Residents of the Morenci and Valentine areas may be

certain that their only true recourse is to claim the protection of their Constitutional Rights, and take legal action to stop the implementation of what will be a true, uncontrolled medical experiment on the effects of chronic exposure to sonic booms on human beings. (Page ii—"There is little doubt that noise including sonic booms acts as a stressor, but it is not known with any degree of certainty whether prolonged exposure results in cumulative pathology."

The Air Force conclusion of no significant impact is not legal in the sense of 'Regulation' 1508.27 which states in part....."Significantly" as used in NEPA requires consideration of both context and intensity: (a) ... Both short-term and long-term effects are relevant. (b2)...The degree to which the proposed action affects public health or safety.(b4)The degree to which the possible effects...are likely to be highly controversial.(b5)The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks." (emphasis mine)

Clearly, the Air Force must acknowledge their proposal will result in a significant impact on human beings, by definition of the very Act that moved them to create these documents.

The Air Force needs to maintain the highest standards and efficiency in air combat training. No one questions this need. But the true costs must be tallied. This training can be performed elsewhere, as it is now, and in the type of environment where the impact on human beings will be zero. Again, it should be stressed that there is virtually no possibility that the Air Force will account for the true human costs of these proposals. The citizens' only recourse is to the legal system, based on the Constitutional protections that are the right of everyone, even "six highly annoyed" New Mexicans. This is not a technical problem, it is an ethical and moral issue.



## INTRODUCTION

There are few, if any, regions in the free world where civilian populations are legally subjected to the conduct proposed for Valentine and Reserve, by the Air Force. The Papago Indians are being overflown supersonically at this time by the Air Force. The resulting structural damage and resulting effects on human health and welfare are considerable. There is at this time no EIS available based on the DEIS for the proposed supersonic flight at SELLS. The point appears to be that even without a Final EIS actions can be taken, as proposed, with impunity. The AF has issued itself a waiver, I assume, perhaps illegally. Residents of Texas and N.M. can take comfort in Col. Smith's statement (Page G-68 Valentine RDEIS) that "...in no way, with what we propose to do here, even by the worst stretch of your imagination, as to how many booms a day you can get, will it compare to what we have been doing to the people in Sells Arizona and the environs there too, for the past several years."

The U.S.Navy has proposed supersonic air combat maneuvers over inhabited regions of Central Nevada. Their DEIS may be issued by November, 1983. One might have guessed that the Navy needs to "maintain air crew efficiency to prevent the degradation of the National Defense posture and for purposes of National Security." The AF intends to sonic boom eastern Nevada in Gandy MOA.

The Board of Commissioners of three counties in Nevada, have all passed resolutions stating their strong opposition to the Navy's proposal. The Nevada State Medical Association has declared its opposition to the proposal on the basis of concerns for the health and welfare of the civilian population. Ninety-seven percent of all the physicians practicing in rural areas of northern and central Nevada, have signed a petition requesting the

government to appoint a technical advisory committee to independently evaluate the data being used and abused to allow the Navy to reach the presumed conclusion that sonic booms produced by low altitude supersonic air combat maneuvers will not significantly impact human beings living below. This petition was instituted upon the clear presumption that much of the data and the interpretation it undergoes, will be misleading, based upon past experience here (and the analagous situation exists in Morenci and Valentine).

Perhaps Nevadans will receive a better quality document. The main Naval coordinator for the Central Nevada SOA, in San Bruno, California, when asked if the documents produced by the Air Force for Morenci and Valentine would be utilized in the Navy's document, replied in the negative. When queried as to the reason, the coordinator commented on the poor quality of the documents. However, this may be a simple case of interservice rivalry.

151 The largest organization of civil aviators in the world, the Aircraft Owners and Pilots Association (U.S.A.), has declared that the underlying concept of supersonic operations in a Military Operating Area, is hazardous to the saftey of all aviators. In an MOA, all pilots, both civilian and military have free use of the airspace upto 18,000 feet above sea level, freely aviating without restriction or hinderance or outside control other than the F.A.R. 's which govern flight in all airspace in the U.S.A. The AF uses the term "set aside" to refer to the SOA. There is nothing set aside in the proposed SOA's, except the limitation supposedly that military aircraft can not go supersonic outside that region. The implications for civilian pilot saftey are false however.

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Perhaps the only element to be set aside will be the aircraft insurance on the civilian aircraft which operate at their own risk in the SOA. One

major civil aviation insurance company contacted by phone stated that insurance written on a civil aircraft legally flying in an SOA such as proposed, would be invalidated due to the hazardous nature of the activity.

152 The rules of flight in a MOA are "see and avoid". The supersonic activities conducted in these MOA's by the military are legally defined as ultra-hazardous and should be confined to restricted areas. Obtaining a restricted area is a rules-making procedure and the military is avoiding this approach. However, the nature of the activities here would, as AOPA states, create "de facto restricted areas obtained outside of normal legislative channels." These hazards and questions have been glossed over in the present RDEIS's.

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Citizens of Texas and New Mexico complained in the hearings that their numerous petitions to the Air Force and others, went unheeded. In Nevada, numerous petitions have been compiled and forwarded to the government and the Navy, without any results. Citizens in Nevada have filed before the U.S. District Court in Nevada for relief, requesting a preliminary injunction to halt the proposed supersonic bombardment. It should be plain to residents of other rural areas that are similarly threatened, that despite all the talk and pleas, only recourse to the courts will restrain these federal agencies from taking actions that will cause irreparable harm to human health and welfare.

153 By attempting to create SOA's over inhabited regions of the country, the Department of Defense has undertaken a major federal action which is included in 'Regulation' 1502.4, a section dealing with "broad" federal proposals which require an EIS to address the proposed action's effects as a whole, not on a site specific basis. 1502.4c states, in part...."When preparing statements on broad actions (including proposals by more than one agency),

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agencies may find it useful to evaluate the proposal(s) in one of the following ways: 1. Geographically, including actions occurring in the same general location, such as a body of water, region, or metropolitan area. (one notes here that the siting criteria for all military federal agency SOA proposals certainly select out specific rural areas as targets).

2. Generically, including actions which have relevant similarities, such as common timing, impacts, alternatives, methods of implementation, media or subject matter...."

153 Presently, each SOA proposal is targeted upon a small population by a federal agency, whether Air Force or Navy. The major federal action for supersonic flight over civilian populations clearly requires a 'generic' or 'programatic' EIS, prior to allowing each federal agency to produce its own site-specific version of an EIS. A 'generic EIS' led to the cancellation of the Supersonic Transport overland flights several years ago. The federal government must, before implementing any SOA's over civilian populations, complete a satisfactory generic EIS addressing the central issue as to the hazards to the safety, health and welfare of human beings, and the many associated issues. This issue should be dealt with in the courts if the federal government does not proceed voluntarily in compliance with the requirements of NEPA of 1969.

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As the various federal agencies are presently proceeding, each impacted region is dealt with separately. This effectively fragments and mutes any concerted actions of the relatively small groups of citizens in the different rural areas who have been selected by identical siting criteria for what was previously, quite correctly, called an uncontrolled medical experiment.

The ethics and morality of this situation demand redress. Recourse to the courts is the only real means of addressing the issue. Do it yourself.

The EIS that may result from the RDEIS's at hand, will not be reviewed by any capable persons outside of the leading agencies which produced the documents. Certainly the EPA and the CEQ (Council on Environmental Quality) will not produce a scientific critique of these documents. The EPA Region Nine (which includes Nevada) has terminated all their "noise specialists". Budget cuts have affected the reviewing process in all other regions and also other agencies with expertise in this area, such as the F.A.A.

Science, August 5, 1983, page 529...."The Council on Environmental Quality (CEQ) has fallen on sorry times since the days when its halls were thronging with experts, its reports were abundant and much-heralded, and its chairmen had the ear of Presidents...The House Appropriations Committee is particularly unhappy about CEQ. In its report it says that "not a single scientist or technical expert is on the permanent staff," which "renders the Council unqualified to offer substantive contributions or policy advice."... The CEQ is regarded as having performed an extremely valuable function in the past, issuing reports, monitoring the National Environmental Policy Act (NEPA), performing policy analysis, acting as a direct line to the President on environmental issues, and putting out an annual report that contained extensive independent analyses of environmental progress and problems. Now, as far as many observers can see, all that CEQ does is put out tardy annual reports that are little more than justifications of government policies."

In short, the only outside review these RDEIS's will receive, will be from the lay public themselves. There will not be any scientific review by qualified persons of the conclusions presented by the AF and Navy, which perhaps renders the demand for a generic EIS moot in any case.

Finally, after reviewing the first draft EIS and the subsequent revision, my personal opinion is that these documents have arisen from a long

tradition. This tradition is---proceed unless opposition is truly formidable (referring here to bureaucratic types of actions), bring out inhouse experts, and use the Mark Twain rule of EIS creation.

S. Hammon, a senior partner of the Vibration Damage Specialists in Louisville, writing several years ago in the American Bar Association Journal commented upon a document produced by the Air Force, entitled "Sonic Boom Fact Sheet".

Hammon wrote: "When the fact finding bodies are called upon to make decisions concerning sonic booms...in the near future, statutes, precedence, and customs will not exist. If guesswork is to be avoided, dependence must be placed on the opinion of learned experts. I stress Gray's qualification "learned", since there are a host of experts, but only a few who have the basic qualifications to allow them to understand this subject. The greatest offenders in this respect, strangely enough, are the two agencies who fly the greatest number of jet planes--the Air Force and the Navy....All reference is to a mythical "they", who remain completely obscure. Most of the attempted answers have summations which are ludicrous due to over simplification and lack of relevancy to the arguement, which they pretend to sum up. From the beginning to the end this work is erroneous."

#### DATA BASE

The information upon which the RDEIS's are based is available to the layperson; articles in the scientific literature, books, etc. This is the same information on supersonic flight and its unwanted stepchild, the sonic boom, which the Air Force uses to produce these documents. The statement of the panel member noted earlier, that the AF did not review all the literature

nor was it required to, is unacceptable. Also, as noted earlier, there will not be any independent qualified scientific review of these documents. National security has been raised as an issue in each and every of the SOA proposals, including the two in Nevada. The wording, warning of severe degradation of air crew combat readiness and the subsequent effect on the national defense posture, appears to issue from the same word processor.

There are no citizens who would not make sacrifices that are actually essential for national security. However, numerous deceptions have negated the average rural citizens' instinct in these regards. The primary victim of these RDEIS's are the scientific data. To ameliorate this inbuilt bias, it was suggested earlier that independent, unbiased, technical commissions could be created to evaluate the proposals and the central concept itself. Other organizations also have reviewing abilities such as the General Accounting Office and the Congressional Research Service.

In the pages that follow, several of the fundamental assumptions or interpretations of the AF are questioned, mainly on the basis of the documents that the AF itself has used. A dispassionate review of the scientific literature and the documents produced by the AF leads to the conclusion that the present documents are inadequate as a foundation for an EIS, due mainly to the selective nature of the presentation of evidence and facts and at times to the apparently deliberate distortion of scientific data.

The time required to comment on these documents in their entirety is prohibitive. However, the points made later in this comment paper are not highly selective, that is, the errors and misrepresentations commented upon are distributed throughout the entire AF documents.

### THE LOGIC OF THE RDEIS's

The strength of a structure can be no greater than the strength of its foundations. In the case of the AF documents, the final conclusion of "no significant" impact upon human beings due to low altitude supersonic overflights can be traced back through the literature, and the seminal documents and the scientific foundations can be examined. The conclusions drawn from these documents, which are then used to draw further conclusions etc., then allow us to evaluate the statements and assumptions made in final analysis.

It is instructive to compare the first DEIS with the RDEIS, simply to educate oneself as to the creative interpretation of scientific data. However, concerning ourselves with the RDEIS, the following represents the apparent logic the AF utilized in deriving their final conclusions.

1. The CSEL of individual sonic booms are calculated from expressions utilizing the peak overpressures of a sonic boom.
2. C-weighted DNL are computed from the CSEL of individual impulses.
3. C-weighted day-night levels were derived on the basis of community responses to sonic boom exposure, mainly Edwards AFB and Oklahoma City tests.
4. CDNL are accurate measures of human response to the acoustic impulses we call sonic booms.
5. The EPA, in approximately 1976, proposed the use of a C-weighted day-night level to estimate the response of other communities to large amplitude single event impulsive noises, i.e. sonic booms.
6. Carlson developed a simplified method of estimating sonic boom overpressures created by various types of aircraft and blunt bodies, a paper published in 1978. (Carlson's nomograms already appeared in 1966)
7. On the basis of 21 sorties by the F-15 at Oceana, Bolt, Beranek and



Newman, who have done numerous studies for the military, used Carlson's simplified method to estimate the sonic boom overpressures that were produced at sea level when the 21 aircraft were supersonic.

154 8. BBN then use a table based on a standard atmosphere which reveals that less than one third of the supersonic events produced a sonic boom which could have been detected at ground level. One flight was excluded so as not to bias the final results. 154

9. The long term average sound level at points on the ground was determined by the average CSEL per event, the number of events and a probability factor.

10. BBN used a "rough" approximation that these 21 flights occurred in an elliptical area and through a series of calculations arrived at the resulting sound exposure levels within two concentric ellipses which contained the aircombat maneuvers of the F-15.

11. On the basis of the CSELS for the ellipses, the CDNL's were calculated. (based upon 15 sorties per day, 5 days weekly, 52 weeks yearly, no night time operations and less than one boom per supersonic flight).

155 12. Since the number of "superbooms" could not be calculated by BBN "from the present data", they state that one of the 18 booms reported by residents of Valentine tests (June, 1978) was a superboom. Thus they conclude that "With lack of any other data, in this analysis it is assumed that one boom in 20 reaching the ground will be a superboom." 155

13. BBN determine that superbooms will not affect the CDNL on a long term basis.

14. BBN adjust their calculations for the ground level in New Mexico and Texas and determine that maximum CDNLs to be produced in Reserve or Valentine are scarcely above 61 decibels. No corrections for changes in humidity noted.

15. The Air Force places these ellipses into portions of Valentine and Reserve MOA's and notes that these sound levels are less than those recommended maximums for normal urban residential neighborhoods and that at the most, only five or six citizens will be highly annoyed by supersonic air combat maneuvers in their county.

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In returning to the roots of the data base, the tests at Edwards AFB and the Oklahoma City tests, one is reminded of the strength of the data that is the foundation for the finding of no significant environmental impact in the RDEIS. (from Schomer's paper : "Evaluation of C-Weighted Ldn for Assessment of Impulse Noise", J. Acoust. Soc. Am., Vol 62, No.2, August 1977.)

Even without consideration of studies that show truly rural areas are far more susceptible to the effects of noise, either impulsive or non-impulsive, the OC 'tests' are a very shaky foundation upon which to base conclusions noted in the RDEIS.

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Only a few points of many may be noted. Oklahoma City was chosen for these tests because it was an aviation oriented community, experienced with sonic booms. As part of the program, "control of the truth" was exercised in that a massive publicity campaign was conducted prior to the tests to inform the citizens that they would be subjected to sonic booms from overflights that were designed to determine if the SST should be developed. This program was portrayed as of great economic importance to OKC and the entire country. The residents were told that their reactions would be crucial to the development of the SST. The majority of the respondents knew that the test was of six months duration and that a favorable response would help the SST.

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Despite these and many other such factors, once the tests began, numerous court actions were taken to force the cessation of the tests due to the impacts of low overpressure sonic booms. Legal actions included both private plaintiffs and the Oklahoma City Council, itself. At this point the numbers of complaints were very high. As the courts declined to offer relief to the plaintiffs (this was a 'test'), the numbers of complaints declined dramatically. It is upon these numbers that we obtain figures showing that overpressures, averaging about 1.2 psf, "annoyed" only a certain percentage of people.

The results of these "controlled" sonic booms are meaningless when applied to the proposals at hand or when extrapolated to indicate the benign effect of long term exposure to high intensity sonic booms. The above is only one of many points that could be made in this connection.

The response of humans to sonic booms is reported in various studies and in the RDEIS in terms of "annoyance". "Annoyance" is a term that has no legal standing. You cannot sue anyone because they have caused you to become extremely annoyed. You cannot claim inverse condemnation of your property because an agency of the U.S. Government has caused you extreme annoyance. The term represents an amalgam of disturbing events, such as interference with sleep, interference with conversation, anxiety and fear engendered by noise or perceived danger, etc. The point is that when an RDEIS claims certain levels of annoyance will occur, no legal or even meaningful statement has been made.

It is noted that all the figures relating to overpressures that "will" occur in these SOA's, are calculated. No measurements were made at Oceana, no measurements were made during the "Valentine Tests", etc. Results are based on 21 sorties from which, on the basis of nomograms, calculations, estimations

and approximations (from aircraft in level flight in standard conditions).

157 Perhaps most indicative of the presumptive nature of the data is the statement by Bolt, Beranek and Newman that "Determining the probability of a superboom occurring, per aircraft sortie, is not readily possible from existing data...With lack of any other data, in this analysis it is assumed that one boom in 20 reaching the ground will be a superboom."

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158 The French "Jericho" tests are noted several times in the RDEIS and the bibliography. These researchers went to great lengths to obtain actual measurements of sonic boom overpressures and locations of sonic booms made by fighter aircraft engaged in standard aircombat maneuvers. These researchers, whose evidence was available to BBN and the AF, state: "All aircraft produce at least one focus boom when they start supersonic flight(focus due to acceleration). Military aircraft which make high load factor maneuvers produce focus and superfocus booms all along the supersonic airpath."

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Again, simply one point amongst the hundred that indicate how unreliable the RDEIS is. It would be appropriate to note here again, that in the RDEIS as in the first draft, the terminology relating to superfocused booms is used incorrectly.

The simplified method used by the AF to obtain SOA's should be patented. For the first time in this land one is able to lose Constitutionally granted rights (the freedoms that we are protecting, presumably) on the basis of calculations performed by a simple, handheld calculator.

159 An internationally recognized expert on sonic booms, one who is noted in the RDEIS, told me that the CDNL levels recommended by the EPA and HUD are certainly too high, even presuming that they in some manner measure the true response of human beings to sonic booms.

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In sum, if time allowed, the RDEIS and its substructure could be shown,

item by item, to be inadequate, both as a document that pretends to scientific accuracy and as a legal document from the point of view of NEPA of 1969.

If, as the Air Force states, the sonic boom impacts in Reserve and Valentine would be far below EPA and HUD sanctioned levels for an urban, residential neighborhood, then fly the aircombat maneuvers over the cities. The noise levels, the AF states, could be doubled and still fall within these guidelines. If the environmental impact of the sonic booms is so minimal, then why did the suggestion of residents of New Mexico, to fly all missions over Valentine, cause Air Force Col. Jeff Smith to say "For those who say take it all to Valentine, I find that unconscionable personally." (page 193 of the Reserve RDEIS). If the levels of both areas are so low that even doubling the number of sorties in one area would not cause the HUD criteria to be exceeded, then why does the Air Force indicate that an ethical problem would be involved with this shift?

Finally, as many persons at the hearings asked, why was the question of flying supersonic over inhabited rural areas not raised earlier? After all, and contrary to the impression given in the hearings, these aircraft (F-15 and F-16) became operational several years ago and their supersonic flights at Mach 1.1 have been attained routinely by military fighters for two decades. It should be noted that the F-15 went to Holloman AFB on the basis of the positive finding noted in "Environmental Determination for the Proposed Beddown of F-15/T-38 Aircraft at Holloman AFB, N. Mexico (Oct/76)." The same number of sorties were planned then, as now. Part (c) of the summary states in part: "Supersonic training flights will be increased by the conversion of F-4 to F-15 aircraft. However this air combat maneuver training will take place over the White Sands Missile Range (WSMR) and will not

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affect the area outside the boundaries of the WSMR. The supersonic events will increase from 550 to 1300 per year." (P.SIC)

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#### F-15 Combat Maneuvering

This subject is chosen from many others, simply to illustrate another manner in which the RDEIS is a particularly flawed document, stretching even the laypersons' logical sensibilities to unacceptable limits.

The RDEIS states that aircombat maneuvers will average Mach 1.1, and utilizing the concept of Threshold Mach (calculations only) notes one third of all sonic booms will reach the ground, resulting in no significant impact on the environment. National security will be upheld, the national defense posture maintained and the Air Force crews maximally prepared by air combat training within these limits.

Page 1-3..."The F-15 missions require accomplishment in areas set aside for supersonic flight to utilize the aircraft in a supersonic regime. This flight regime is characterized by increased maneuverability, high G-loads, and high closure rates."

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Page 1-9..."By operating in the subsonic flight regime only, pilots are denied valuable experience in the vastly different performance and handling characteristics of the aircraft in the flight envelope above Mach 1.0." (added emphasis)

Elsewhere we are told (the page number escapes me) that because of the advanced design of these aircraft, pilots can slip through Mach 1.0 without noticing, and that the attention necessary to stay at Mach .99 degrades the training mission. Thus it appears that the "vastly different performance and handling characteristics" of the Mach 2.5+ capable aircraft are maximal between Mach 1.0 and Mach 1.1.

Page 4-20..."All participants must decrease altitude to utilize the maximum acceleration and turning of their aircraft." (not quite the straight and level flight of Carlson's simplified method). Aviation Week and Space Technology, May 23, 1983, page 75, discusses the F-15 G-overload warning system. "The warning is continuous until the overload condition is relieved. This system permits the full 9-G limit use of the aircraft, enabling the pilot, whenever possible, to open up the flight envelope."

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Page 8-1..."Due to the advanced characteristics of the F-15, supersonic flight is required if pilots are to effectively employ the aircraft in the role for which it was designed and procured...combat ready pilots would be fully able to explore the aircraft performance capabilities and develop practice and refine sound combat tactics and habit patterns in the supersonic flight regime...". (Most pilots would agree that it is difficult to explore the flight envelope of a Mach 2.5+ aircraft while remaining between Mach 1.0 and Mach 1.1. The quote in the paragraph above is a case in point.)

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Next it is noteworthy that the development of the F-15 through the various models, to the F-15D and the Strike Eagle, have been directed to the objective of creating an all-weather, day-night capable aircraft, with equally great air-to-air and air-to-ground capabilities. This will of course produce great numbers of night flights for training purposes and certain types of maneuvers which will consistently generate large numbers of focused booms. Also, an ACMI like system must be installed in N.M. and Tx..

Referring back to the quote from page 1-3, it must be re-emphasized that there is nothing "set aside" about a SOA, from a pilot's viewpoint. This airspace is freely available to all aircraft, military and civilian—only at supersonic speeds it is transformed into a 'killing ground' that AOPA has correctly labelled an extreme hazard to civil aviation. The RDEIS glosses

stressed repeatedly, that their theoretical figures are conservative, are incorrect. The real atmosphere often focuses sonic booms, the effect being greater at the lower Mach numbers the AF says it will average. Scant, or no attention, is paid to studies which have measured the amplification factors related to rectilinear acceleration; multiple booms created in this fashion; noting the fact that multiple, separate booms are created during turns, and superfocused booms in accelerated turns; amplifications created when the sonic boom envelopes of supersonic aircraft intersect during a pass in opposite directions and during overtaking maneuvers. It is nowhere stated that the focused boom in a turn will be "thrown" from ten to twenty miles lateral to the flight path of the aircraft turning. Audible rumbles, that many scientists term significant, occur for tens of miles lateral to the cutoff. Terrain amplification factors of 12 and greater have been measured. Amplification factors due to being near buildings can result in 4 fold or greater sonic boom overpressures (cf. calculated values). Dynamic amplification factors have been scarcely mentioned, although they constitute an impact of major proportions. Even in straight and level flight, variations of overpressures below and lateral to the flight path vary 3-4x, simply on the basis of unknown factors, presumably atmospheric turbulence. These results are from studies in which actual measurements have been performed.

Even at threshold mach, a caustic is formed. It may not reach the ground but if a resident, or one of the more than 60,000 yearly visitors to this area is standing on a hill, he or she will be on the receiving end of a sonic boom that will be at least two times that of the calculated overpressure.

It might be emphasized that most discussion relates to overpressures, both those measured by others and not used by the AF, or those theoretical overpressures calculated by the AF for this RDEIS. Peak overpressure is one



element that is used to judge the impact of a sonic boom, but it is not the  
165 peak overpressure that is the major correlate with the annoyance expressed by  
persons below. Also the AF assumes a normal distribution of data obtained  
from the Oceana sorties. It is clear from their charts that the data cannot  
166 be normalized in a sense that makes the data a basis for statistical  
predictions.

Returning to page 3-10, one can illustrate several of the previous  
points. One notes that the AF hopes to demonstrate that longitudinal  
accelerations of an aircraft at an altitude and Mach number above cutoff,  
produce relatively small areas of focused sonic booms, that are occasionally  
up to 2 to 5 times the overpressure of normal "N" waves, but that a highly  
stable atmosphere, in their own words, must exist for these events to occur.  
After noting Operation Jericho, the AF states that turbulence decreases or  
dissipates the boom; the AF notes that "the most important point is that the  
peak pressure of a focused boom decays more rapidly than in an "N" wave and  
167 thus the positive impulse is much lower..."

Re-emphasizing that turbulence (i.e. the real world atmosphere) causes  
frequent focusing effects, even for aircraft in low Mach, level flight, that  
peak overpressures are not the major correlate with impact on humans, one  
notes that in Operation Jericho the rise times and the peak impulse of  
focused booms were highly significant and that the true effects of focused  
and superfocused booms are such that amplification factors range from 2 to  
greater than 9. In other words, a focused boom is a focused boom.

On page 3-11, the AF states that focused booms do not move along the  
ground as is the case with carpet booms and that the focal zone is fixed. The  
168 focal zone is fixed only in relation to the position of the aircraft at the  
time the caustic is produced, which is common sense. The focus for the

the caustic moves along this region in exactly the same sense as a carpet boom does, before it becomes extinguished. This focal zone is usually the site of two or three separate sonic booms which occur in rapid succession (not to be confused with the 'double boom' of the 'N' wave of a normal sonic boom). These impacts have not been addressed in the RDEIS.

As noted earlier, the fact is alluded to, but not stressed, that studies have shown that the area involved with a simple longitudinal or rectilinear acceleration, even at high altitudes, is accompanied by a focused boom and then an associated area in which 4 to 6 multiple booms occur, each equaling the overpressures of the carpet boom. These booms have similar impacts on humans but are not included in the RDEIS.

The AF states that in supersonic turns it is quite possible that sonic booms and focused booms will not reach the ground unless the Mach number and altitude exceed certain conditions. Using tables in the sonic boom literature one can easily determine whether this statement has any meaning other than to deceive.

For an fighter such as the F-15 at Mach 1.3 and an altitude of 33,000 feet, production of a focused boom can be avoided if the bank angle does not exceed 10 degrees. This translates into a heading change of 0.4 degrees per second (perhaps a slight overestimation). Thus the F-15 requires six minutes to perform a simple course reversal under the conditions devised by the AF. During this time it would travel approximately 60 miles and exit the neat ellipse, let alone the entire MOA. "Bombers and fighters in sustained supersonic flight have to make at least one focusing turn to fly back to home base because the radius of a nonfocusing turn is far too large to be practical." (Operation Jericho).

Page 3-15.... "This is supported by the fact that the tests conducted

in 1968 at Tonapah, Nevada, showed sonic booms with overpressures ranging from 50 psf to 144 psf did not cause direct injuries to the exposed people." Upon reading the paper, one notes that the researchers' main conclusion was their surprise, that when the windshield was blown out of their stationwagon, the glass fragments were propelled outward for a distance of greater than 12 feet. It had been thought that sonic booms caused glass breakage with the fragments dropping neatly at the foot of the window.

Additionally, the researchers noted that the windows of all the campers parked along the low altitude routes, were blown out. By the third day, there was considerable difficulty amongst the scientists taking readings, due to the flinching and stress that occurred, beginning at the time when the aircraft first appeared, let alone the sonic boom impacted.

171 The AF note that no harm occurred to humans is perhaps diluted by the fact that no observations of any nature were made, other than to note that there was a fullness and ringing in the ears, or a pressure like sensation against the body. Mr. Lord, an environmental expert (AF) stated at the Valen. test hearings (Atch.7.30)..."...I know people, I, myself, have been subjected to 100 psf so I know what it sounds like—I didn't hear for a while afterwards."

To the lay person, this phrasing is reminiscent of temporary deafness. No followup studies were done. It is a fact that temporary threshold shifts are forewarnings, if repetitive, of permanent hearing loss. The AF statement is misleading at best. It is also clearly noted in the paper that the startle reflex, which the AF states will habituate, didn't. There is ample scientific documentation that habituation of the startle reflex does not occur. Where the AF so states, its experts are confusing the orienting reflex with the startle reflex. The eventual result is harm to humans via stress.

The orienting reflex (to much lower levels of overpressure than will occur in Valentine and Morenci) can to a large extent be extinguished. However, longer term studies have demonstrated that "behavioral adaptation" is actually a compensatory mechanism. After a period of 'coping', the human organism decompensates. This has been documented in human and animal studies but is ignored or misinterpreted in the AF document.

Page 3-17...The AF states that there are no generally accepted techniques for predicting worst-case, long-term, health impacts from noise exposure. Dr. Worthington is delegated by the AF to represent the most pessimistic views known to the AF. Dr. Worthington has encouraged a scientific overview of the subject. To state that his views are amongst the most pessimistic on the subject of the impact of sonic booms on human beings simply indicates that the AF did not review the literature. The literature is clear that it is only a question of how bad does it get. The AF must address the health effects of chronic sonic boom exposure, in a worst case analysis, as required by NEPA, in their revised RDEIS (the RRDEIS).

\*\*\*\*\*

Nearly every page of the RDEIS deserves correction. It is unfortunate that farmers, ranchers, housewives, TV repairmen and assorted other commoners have to defend themselves against this misuse of scientific data. The archeological study noted in the RDEIS is close to a farce. Two of ten overflights registered "sonic booms" with overpressures of 0.15 psf or in that neighborhood!! No damage to rocks, but no mention of the rock falls precipitated at other archeological sites by sonic booms, described by others.

Alternatives are required by NEPA to be thoroughly researched. Much of what is presented is misleading or ludicrous. Weekend flights over the WSMR are dismissed on the basis of an "informal survey" of an undefined group at

Holloman AFB, citing the problem with morale should this alternative be accepted. Is it the public's responsibility to provide alternatives? The beddown statement allowed the F-15 into Holloman on the basis that no outside areas would be affected. If the F-15 flies down to 15,000 feet, and the T-38 is engaged primarily in air-to-ground gunnery, then both activities can occur at once in the same airspace with a buffer zone between them. This and weekend flights will account for all desired supersonic sorties and put them over uninhabited land.

The costs of all alternatives may appear large, but that is simply due to the fact that the true costs have not been calculated.

\*\*\*\*\*

The Revised Draft statements issued for Reserve and Valentine Supersonic Operations Areas, are not adequate by the standards set forth by NEPA of 1969.

The concept of supersonic flight at low altitudes for long periods of time over human beings, has never been addressed independently (except for the high altitude SST which was cancelled). The AF documents are deceptive. No competent outside experts will evaluate these documents. The AF overflies the Papago Indians, never having completed the EIS process. As Col. Johnson told the people of Valentine (Atch 7.28) "....There are several other people who have to be asked, the Federal Aviation Administration has to be asked. It's impossible, well, I don't want to say impossible, it's improper for the U.S. Air Force to fly supersonic over any area that has not gone through a coordination process or been okayed up through the legislative level of the Government and the FAA. We get our permission from Headquarters U.S. Air Force and that's who okays it."

There is no doubt that the aircraft should be flown, and the aircrews trained to the maximum of capability. But the Air Force is only able to have its cake and eat it too, by producing a document that deceives those who will bear the impact of the proposal.

The time has come for a totally independent, technically competent group to be formed, a true forum of experts created to evaluate the concept of supersonic flight over human beings, at low altitudes; and/or a Congressional investigation should be undertaken to examine these questions on a nationwide basis and dealing with all branches of the military.

There is little doubt that these proposals will be acted upon regardless of the amount of protest, whether emotional, scientific, or otherwise. The only recourse for the common person is to recall exactly the freedoms that the government agency is working to protect and to use those freedoms to secure a just and equitable resolution of the problem.

If the Air Force uses the present inadequate document as the basis for its final EIS, then citizens should, on their own if necessary, proceed with legal action in order to obtain a permanent injunction to protect their health and welfare, the quality of their lives and the land that they live in. This should be done with the clear understanding that the government agencies involved can attain the same maximum quality of training in other ways, but will not attempt to do so unless they are forced to.

COUNCIL FOR PRESERVATION OF WEST TEXAS

MR RALPH VOIGHT

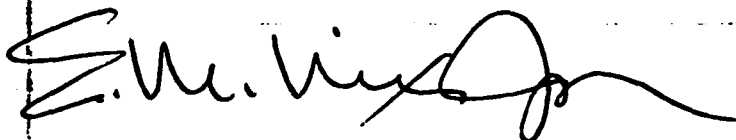
DEAR SIR

I JUST READ THE STORY OF THE AIR FORCE PLANS -  
DON'T LET 'EM DO IT.

WE HAVE BEEN LOOKING FOR LAND AROUND ALABE/  
FORT DAVIS FOR RETIREMENT, NO HUNTING OR  
SCREWING UP THE LANDSCAPE, JUST WANT TO  
LIVE AND LET LIVE, WRITE SOME STORIES, PAINT  
SOME PICTURES, AND ENJOY THE PEACE AND  
QUIET OF THE VASTNESS OF WEST TEXAS.

IF YOU KNOW OF ANY RUGGED (5 TO 100 ACRES)  
PROPERTY, PLEASE CONTACT ME.

AGAIN, I HOPE YOU AND THE ORGANIZATION  
CAN WIN OVER THE AIR FORCE.



E.M. NIX, JR

604 W. INWOOD

ARLINGTON, TEXAS 76010

COUNCIL for the PRESERVATION of the WEST TEXAS FRONTIER

Box 400

Fort Davis TX

79734

915-426-3414

29 July 83

Mr Alton Chavis  
HQ TAC/DEEV  
Langley AFB VA 23665

Good Morning:

We are in receipt today of the Revised Draft EIS ...Valentine MOA. We will greatly appreciate receiving 10 more copies of this for distribution to the Commissioners and Judge of Jeff Davis County, Presidio County, and other officials of the area who, upon query, did not receive copies, including the director of the Fort Davis Natl Historic Site.

If possible, we should also like at least one copy of the Reserve MOA EIS, since the undersigned is now a part-time resident of that area.

Sincerely,



R. Voigt, Coordinator

P.S. If no longer classified, may we have a copy of reference 96, page 11-8, Economic Impact Study-Valentine and Morenci MOAs, Team Four, Inc, St Louis, May 1980.....as well as 94, Development of C-Weighted Day-Night, etc., 107 Prenatal Effects of Exposure to High Energy Impulsive Sounds; 104, Response of Raptorial Birds, etc.

*If any charge for these, your invoice for same will be honored by return mail.*



4 AUG 1983

DEEV

Valentine Military Operations Area Environmental Impact Statement - Revised Draft

Mr. R W Voigt, Coordinator  
Council for the Preservation of the West Texas Frontier  
Box 400  
Fort Davis, Texas 79734

1. Reference your 29 July 83 letter acknowledging receipt of the subject EIS and requesting additional documents. Per instruction of this letter, the Public Affairs Officer at Holloman AFB will forward you ten (10) copies of the subject EIS. While we have already taken steps to provide county officials a personal copy of the EIS, your interest and assistance in assuring widest dissemination of the document is appreciated.

2. We are enclosing one copy each of:

a. Economic Impact Study - Valentine and Morenci Military Operating Areas, Team Four, 1980.

b. Development of C-Weighted Day-Night Average Sound Level Contours for F-15 Air Combat Maneuvering Areas, BBN Report 4430, Aug 1980.

c. Prenatal Effects of Exposure to High-Level Noise, National Research Council, 1982.

d. Responses of Raptorial Birds to Low Level Military Jets and Sonic Booms, Oct 1981.

e. Reserve Military Operations Area EIS, July 1983.

FOR THE COMMANDER

**SIGNED**

RICHARD A. POLI, Major, USAF  
Chief, Environmental Plng Div

5 Atchs

1. Team 4 Study
2. BBN 4430
3. CHABA - Prenatal Report
4. Ellis Study
5. Reserve EIS

!CHAVIS/DEEV/4 Aug 83/mlg/1579V/4430

**COUNCIL for the PRESERVATION of the WEST TEXAS FRONTIER**

**Box 400**

**Fort Davis TX 79734**

**915-426-3414**

**8 Aug 83**

**Mr Alton Chavis  
HQ TAC/DEEV  
Langley AFB VA 23665**

**Sir:**

**Since you did not see fit to send copies of the Revised DEIS - Valentine MOA to the various officials whose citizens will be involved and affected, we ask that you immediately rectify this by sending copies as follows:**

**To the Mayors of:            Sierra Blanca, Texas  
                                 Van Horn, Texas  
                                 Marfa, Texas  
                                 Presidio, Texas  
                                 Valentine, Texas**

**5 copies to:**

**The Judge & <sup>4</sup>Commissioners of Hudspeth County, Sierra Blanca  
"    "    "    "                           Culberson County, Van Horn  
"    "    "    "                           Jeff Davis County, Ft Davis  
"    "    "    "                           Presidio County, Marfa**

**The Director of the Fort Davis National Historic Site, Ft Davis**

**Since you did not send timely copies to them and since it will take time to reach them, study them and then present them in monthly Commissioners and Mayor's meetings, we ask that you extend the time for reply to at least November 30, 1983.**

**It will also be helpful to schedule the Valentine meeting for that month, as well, in order to gain the fullest value from it with the additional input that will result from the above mailings.**

**Thank you.**

**Sincerely,**

**Coordinator**

**cc: Secretary of the Air Force**

**Sen. John Tower, Chrmn, Senate Armed Services Cte**

**Rep. Ronald Coleman, House Armed Services Cte**

**Commander, 49TFW Holloman AFB**

**John Rittenhouse, Deputy Asst Secy AF Inst, Env Safety**

18 AUG 1983

DEEV (Mr. Chavis, 4430)

Valentine Military Operations Area Environmental Impact Statement - Revised Draft

Mr. R W Voigt, Coordinator  
Council for the Preservation of the West Texas Frontier  
Box 400  
Fort Davis, Texas 79734

1. We appreciate the concern expressed in your 29 July 83 and 8 August 83 letters about distribution of the subject EIS. Our 4 August 83 letter to you explained that steps had been taken to provide copies of the EIS to officials in the affected counties. As a means of informing individuals and agencies that were not on our distribution list, we requested local newspapers publish an announcement concerning availability of the EIS. In addition, more copies were hand carried to County Clerks on 15 and 16 August 83 for local distribution.

2. In context of the Council on Environmental Quality Regulations on Implementating National Environmental Policy Act Procedures (40 CFR 1500-1508), distribution and availability of the EIS was adequate to allow sufficient time for public comment by 30 September 83.

FOR THE COMMANDER

THOMAS L. LORD  
Director of Eng & Env Plng

CC: 49TFW/CEE

JAC  
RHC

PAM  
RHC

PC  
!CHAVIS/DEEV/17 Aug 83/mlg/1648V/4430

COUNCIL for the PRESERVATION of the WEST TEXAS FRONTIER

Box 400

Fort Davis TX 79734

915142613414

11 Aug 83

Mr Alton Chavis  
Hq TAC/DEEV  
Langley AFB VA 23665

Good Morning, Mr Chavis:

Would it be possible for you to provide us with a copy of BBN Report #4439, related to in a letter to you dated 24 October 1980 from Bolt Beranek and Newman Inc which you sent me some time ago?

Also, if possible, we would like to have a transcript of meetings held with residents to discuss the implementation of the MOA over the Papago Reservation (Sells?).

We discussed with our Representative, Ronald Coleman, yesterday the possibility of scheduling a public meeting sometime in November, instead of the proposed September date in order to give the various towns and counties involved a chance to have meetings on the subject after the Mayors, Judges and various Commissioners have received the Revised DEIS.

Judge Ann Scudday of Jeff Davis County tells me Holloman called her and advised 5 copies would be on the way shortly....the next Commissioner's court meeting is scheduled for September 12 and I imagine a public hearing will then be called for the October meeting, the 10th.

Sincerely,

Coordinator

COUNCIL for the PRESERVATION of the WEST TEXAS FRONTIER

Box 400

Fort Davis TX 79734

915-426-3414

11-Aug 83

Mr Alton Chavis  
HQ TAX/DEEV  
Langley AFB VA 23665

Good Morning, Mr Chavis:

Would it be possible for you to provide updated information concerning  
the Gladden, Sells, WSMR and Desert, NV MOAs:

	1979	1980	1981	1982
Total Complaints				
Total Sonic Boom Complaints				
Damage Claimed (\$)				
Damage Claims Paid (\$)				
Damage Claims Disallow (\$)				
Damage Claims Pending				
Ellipses, no. of Residents in each, (data similar to that in the Reserve and Valentine DEIS's)				

We should also like a response to this question: "Why, in the Bolt Beranek  
and Newman SOW is there no item relating to information presented by the  
citizens at meetings other than the offhand statement in 3.0 , last paragraph."?

That our 88-point critique was not considered is evidenced by the fact that  
many of the same factual errors pointed out were repeated in the revised DEIS;

Sincerely,

RW. [Signature]  
Coordinator

p.s. Would you also tell us the number of square miles of private land which  
lies within the perimeter of each of the 4 MOAs, as well as (separately)  
in the buffer zones.



## DEPARTMENT OF THE AIR FORCE

HEADQUARTERS TACTICAL AIR COMMAND  
LANGLEY AIR FORCE BASE, VA 23065

REPLY TO  
ATTN OF:

DEEV (Mr. Chavis, 4430)

19 AUG 1983

SUBJECT:

Valentine Military Operations Area Environmental Impact Statement - Revised Draft

TO:

Mr. R W Voigt, Coordinator  
Council for the Preservation of the West Texas Frontier  
Box 400  
Fort Davis, Texas 79734

1. This letter responds to your two (2) letters dated 11 August 83.
2. Enclosed is a copy of the BBN Report #4439 and Sells MOA public hearing transcript.
3. Requested information on damage claims for the Gladden, Sells WSMR and Desert MOA'S is not available at this headquarters. We have task the claims officer for each MOA to provide the data to us. We will forward the data as soon as it is available.
4. Reference question on BBN Statement of Work (SOW) concerning review of public comment material. Section 8 of the SOW identifies government furnished materials - which included public comments.
5. We do not have records on private land holdings within the MOA's. There are no buffer zones for MOA's.

FOR THE COMMANDER

**SIGNED**

THOMAS L. LORD  
Director of Eng & Env Plng,

2 Atch

1. BBN Report #4439
2. Sells MOA Transcript

cc: 49 TFW/CC ✓

*Readiness is our Profession*

COUNCIL for the PRESERVATION of the WEST TEXAS FRONTIER

Box 400

Fort Davis TX 79734

915-426-3414

17 Aug 83

Dr William J Galloway  
Bolt Beranek & Newman Inc  
Box 633  
Canoga Park CA 91305

Good Morning, Dr Galloway: Subj: AF Contract FO 8637-80-G0005

We have been studying your Report 4430, Project 07791, "Development of C-Weighted Day-Night Average Sound Level Contours for F-15 Air Combat Maneuvering Areas" dated August 1980.

Not having a mathematician in our organization, we are unable to resolve this question and ask if you can resolve the issue for us:

Since flights will be only on a sunrise-to-sunset basis (approx.

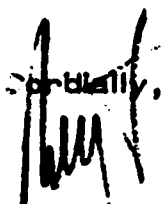
12 hours instead of 24), how will that affect the equation which

is based on a 24-hour schedule....and what final numbers will

change when all are recalculated on a 12 hour average?

In short, it appears to our untrained eyes that a 24-hour average will tend to ease the blows which might otherwise be felt....and that in all fairness everything should have been calculated on the 12-hour proposal.

Your early response will be appreciated.

Sincerely,  
  
RW Voigt, Coordinator

Los Angeles Office  
21120 Vanowen Street  
Post Office Box 633  
Canoga Park, CA 91305  
Telephone (213) 347-8360

**Bolt Beranek and Newman Inc.**

Consulting    Development    Research



19 August 1983

Mr. R. W. Voight  
Council for the Preservation of the  
West Texas Frontier  
Box 400  
Fort Davis, Texas 79734

Dear Mr. Voight:

You have asked how the equation for average sound level would change if a 12 hour average were used instead of 24 hours, assuming that all operations occurred within the 12 hours selected. The answer is, all other things equal, that a 12 hour average would be numerically 3 decibels greater than a 24 hour average.

You can obtain this answer from equation (1) of our Report 4430 by changing the constant of 49.4 to 46.4. This comes about as follows. As noted in the report, 49.4 is 10 times the common logarithm of the number of seconds in 24 hours (86,400). For a 12 hour average, the constant is 10 times the number of seconds in 12 hours (43,200), or 46.4 decibels.

The use of a 24 hour average is a broadly based international convention. When comparing like situations, however, any sensible time base may be used. In some instances hourly averages are convenient.

In application, 24 hour C-weighted average sound level was used to quantify the exposure in the Oklahoma City sonic boom tests for correlation with community response. In this particular case, a non-conventional 12 hours could have been used since all flights were during daytime hours. This would result in a numerical translation of the exposure scale by +3 decibels, but would not change the relationships between response and and the physical exposure to 8 booms per day.

Please let me know if I can provide any further assistance.

Sincerely,

BOLT BERANEK AND NEWMAN INC.

  
William J. Galloway

bcc: Alton Chavis

WJG:rb

Boston    Washington    Los Angeles



P. O. Box 5656  
San Angelo, Tx. 76902  
September 19, 1983

Headquarters  
Tactical Air Command/DEEV  
Langley AFB, Va. 23665

I understand that the Air Force proposes to fly about 300 supersonic sorties a month in the Valentine, Texas MOA. We object to ~~to~~ this proposed action totally.. We will and do protest it in the strongest possible way.

179 | Sonic booms caused by supersonic flights are highly detrimental to the ecology and destructive to the environment as a whole. These flights will cause serious harm and severely degenerate the quality of life for both the human and wild life populations. | 179

  
Jon Ayres

To whom it may concern:

We are strongly opposed to the flights of supersonic aircraft in the Valentine area. Studies have given conclusive evidence that these practices are devastatingly harmful to property, to wildlife, to livestock, to environmental balance, and most seriously to humans.

We are extremely desirous of protecting our nation with strong defense in every way.

We support Mr. Reagan's defense policies. However, we urge that these supersonic training flights be held over the ocean or over publicly owned lands.

Sincerely,  
Nancy L. Lynch.  
Hester Brite Vandewere

My six children are heirs of the Brite Estate.

Box 725  
Marfa, Texas 79843  
November 1, 1983

Mr. Alton Chavis  
Headquarters Tactical Air Command  
Langley Air Force Base, VA 23665

Dear Sir:

This letter is in response to the now on-going sub-sonic and the planned super-sonic air maneuvers in the Valentine MOA by the 49<sup>th</sup> TFW at Holloman AFB, New Mexico. At the outset, let me insure my positive stance in regard to U.S. military preparedness for purposes of defensive solidity and purposes of offensive assuredness in those circumstances when aggressors have left no other option to be considered. This letter, then, should not be construed as an assault upon the Air Force's function, rather it flows from a concern about a waning of the historical repose between the civilian aggregate and the military. It flows from a fear of the fact that some mid-to-high-level military decision-makers are becoming increasingly recalcitrant to the physical, psychological, and aesthetic needs of the lay individual.

Pointed examples of such disregard for citizen dignity are focused in the Air Force's insistence upon continued and expanded use of the Valentine MOA.

This letter shall address both information in and lacking from the July, 1983 DEIS. I wish to remark upon the following topics:

- I. The lack of meaningful parallels which can be drawn between urban and rural residents concerning values and orientations toward nature and its alteration.
- II. Issues which arise when addressing the government's use of governmentally owned land and the government's use of privately owned land
- III. Health aspects of noise pollution: Physical, mental, and mental/physical
- IV. International ramifications of continued use of the UMOA
- V. Other faults in the July 1983 DEIS

### I.

#### Lack of Parallels Between Urban and Rural Residents

Rurality of an adult is no longer predetermined by his or her mere birth in a rural area. This was not the case until recently in the history of America. Historically, a child born to rural parents stood a much greater than equal chance of remaining rural for the duration of his or her life.

The trend of the past has changed in most instances. Contemporary rural children and adults often have the opportunities and means to attempt urban life. Many do. Some stay. But during extensive travels and contacts made throughout the Trans-Pecos region of

Texas during the past twenty years, I have found that those who have gone and returned, those who have stayed without ever leaving, those elderly who wish to finish their lives here, and even those urbanites who have migrated to this rural society for the first time all hold similar values and desires concerning the necessity for maintaining the purity (in the very largest connotation of the word) of the land, the water, and the sky.

Varying degrees of sacrifices concerning availability of goods, services, and social interactions are made by ruralists, and, for many of those in the Trans-Pecos region, a high degree of sacrifices are endured. Why? The answer lies in the fact that the man does not create his values, but his values create the man. The serenity both beheld in and achieved by one existing in a near natural environment strengthens the ruralist to endure the inconveniences of separating himself from the fast-paced, loud, impersonal, non-natural urban world. If all persons held the desires of ruralists, then there would be a vastly different societal structure. Urbanites and ruralists have vastly different frames of reference. Meaningful positive correlations between the two groups rarely exist.

It follows then, the Air Force's inferences based upon the "Oklahoma City" and "Army base" sonic boom "annoyance" surveys (July, 1983 DEIS p. 3-16, 3<sup>rd</sup> paragraph) are non sequitur when applied to rural areas.

The same criticism obviously applies to the Air Force's conclusions based upon the quotes of K. D. Kryter (1967) ~~and~~ (July, 1983 DEIS, p. 3-15, paragraph 5) and Donald E. Broadbent (1980) (July, 1983, DEIS p. 3-16, paragraph 1). Evidently, the reliance upon these latter two sources is to supply the Air Force with an ill-sheathed scapegoat for dealing with claims that sonic booms will be or have been detrimental to human psychophysiological well-being. Kryter has stated that noise-related ill-health is resultant from "the noise interfering with normal everyday behavior" instead of the spontaneous automatic reflexive responses which high intensity noises [such as sonic booms] cause. The Air Force fails to recognize that the common everyday noises of rural Trans-Pecos are virtually nil compared to the urban society described by Kryter. His findings, and the Air Force's adaptation of them, have no utility in this isolated rural region. Broadbent's blunted axiom attempts to lay the blame of noise-induced ill-health upon "previous psychological factors" which leave certain persons' behaviors unamenable to noise pollution. An attempt is made to place the burden of responsibility upon the implied instability of an individual instead of noise itself. Please note that it is not the rural regions of the United States which boast their numbers of psychotherapists who analyze multivarious "psychological factors." Again, as concerns the Valentine MOA and resultant noise tolerance, urban and rural parallels cannot be made!

## II. Government vs. Private Use of Land

The United States government owns in excess of 771,000,000 acres of public lands. Of this, 60% of all land west of the 100<sup>th</sup> meridian is governmentally owned. It is unfortunate that the government exposes many citizens in these lands to the traumas of sub and super-sonic noise pollution. It is unthinkable that the Air Force should continue the use of the Valentine MOA or expand the use of the UMOA due to the lone fact that 100% of the land lying under the area is 100% privately owned!

## III - IV Health Aspects coupled with International Concerns

Frightening are the assumptions made by the Air Force in section 3.2.3.1 Sonic Boom Impacts on People in the July, 1983 DEIS. These ill-drawn assumptions concerning the physical and mental health of citizens living within the MOA show a blatant disrespect for the well-being of the citizens of our area and insult the commonsensical and scholarly intelligence of the citizenship!

The Air Force has not even acknowledged the existence of the towns of Ruidosa, Texas and Candelaria, Texas which are both within the Southern Flying ellipse. Does the Air Force not concern itself with the elementary and junior high school children who attend school daily in Candelaria? Being one of

the full-time teachers at Candelaria Elementary, I am concerned about the future short-term and long-term health effects of continued sub-sonic and planned super-sonic flights over this area. In particular I am concerned not only about the hearing problems which develop from such high levels of noise pollution, but I am also extremely concerned about the already noticable effects of such noise (caused by very low level and high level sub-sonic flights directly over the Candelaria area) upon the mental and nervous systems of both teaching staff and students.

Both psychological and physical ramifications have been experienced by area citizens due to the current use of the MOA in the Candelaria area: stomach problems, muscle spasms, ring of the ears, nervous anticipation, ~~the~~ irritability toward co-workers, and breakdowns in positive inter-personal communications. Continued and expanded use of the Valentine MOA will be increasingly disastrous to the health of both adults and students in the Candelaria-Ruidosa area.

<sup>Elementary</sup>  
Candelaria has had on average of 42 school children enrolled in school every year over the last 8 years. The immediate Ruidosa area presently has about 30 students who ride the bus to attend school in Presidio. San Antonio, Mexico, 1/2 mile across the river from Candelaria, Texas has about 40 children enrolled in school. Many other Mexican villages - Filares, Los Fresnos, Cemedor, Barrancos, Chivaria, Las Corchas, El Vado de Piedra, Cerro Alto - with a combined



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approximate school population of 160 students are and will be affected by continued and expanded use of the Valentine MOA.

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## II.

### Other Faults in the July, 1983 DEIS

The early November 4<sup>th</sup> deadline for submitting this letter to your office disallows extended elaboration upon faults in the July, 1983 DEIS. Yet, two cannot go without mention. The Air Force has not recognized the existence of Ruidosa Hot Springs which is a privately owned resort and which lies in the central portion of the Southern Flight ellipse. The resort is a popular and well-visited area for elderly persons especially who are stricken with arthritic problems some of which are severe.

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In addition, the majority of the guests who stay at the cabins and camping facilities at the Ruidosa Hot Springs, located about 10 miles East-Northeast of Ruidosa, travel vast distances to escape the noise and pace of city life for the peace and serenity of this unique area. Expanded use of the VMOA will be detrimental to the tourists' use of these facilities and the tourist-dependent business of the Ruidosa Hot Springs. The owners have expressed increasing concern about how the Valentine MOA is to alter their livelihood.

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Also, nothing in the current DEIS addresses how high altitude sub-sonic and super-sonic flights affect meteorological factors. The area under the Valentine MOA is entirely dependent upon receiving all the moisture nature makes

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possible for it. Being astute weather observers, the long time citizens of the Candelaria - Valentine - Northern Mexico area have recognized the destructive effects these flights have upon the vertical and vortical development of cumulus clouds. In fact, some of the strongest criticisms coming from Northern Mexico concerning flights of the F-15 in this area center around their potential drought-causing nature. The Air Force must address questions and issues of how continued and expanded use of the Valentine MDA is to affect the fragile weather patterns of this desert area.

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Respectfully yours,

*B. Tipton Chesney*

B. Tipton Chesney

October 20, 1983

HQ TAC/DEEV

Langley AFB, VA 23665

This letter is written in connection with the proposed supersonic flight operations in the Valentine Military Operations Area from Holloman AFB New Mexico.

We moved last year from Albuquerque, New Mexico to the Davis Mountain area, 17 miles west of Fort Davis off Hwy 166. We have built an expensive home of frame and stucco construction with double pane windows all around.

My concern with sonic booms, aside from the annoyance and shock factor, is the possible damage to our home. The stucco is only 5/8" thick and subject to cracks which could become a real problem as a result of continuing sonic booms. My experience in Albuquerque, where we had a home of similar construction, was that it was impossible to patch a crack and match the original stucco color exactly. The only proper way to avoid the patched up look was to stucco the entire wall from one end to the other. I am wondering what effect the booms would have on the stucco and whether any damage done will be properly corrected. If cracks appear often enough, I can visualize the trouble we would have with the Air Force trying to make a satisfactory and speedy claim for damages.

Secondly, the double pane windows are subject to stress cracks at high altitudes (we are at 5800 feet elevation) and we have had to replace one window for that reason since the house was built. The replacement had to come from El Paso and took four weeks because the windows were not stock items. I had to install the replacement window myself because the distributor in El Paso would not send installers out 175 miles to do the job. It was a difficult and messy task which I would not care to do often.

Since window damage is one of the main items in claims for damages, I shudder to think what sonic booms could do to my double pane windows and the problem I would have in getting the windows replaced and properly compensated for.

The peace and quiet we envisioned when we moved from a busy city to this mountain retreat would instead become a nightmare of shocks and building damage if the proposed flight operations become a reality. I join the many others in this area who oppose this project.

*J. S. Nigrelli*

Joseph S. Nigrelli

Star Route 1, Box 51  
Fort Davis, Texas 79734

740 Tepic  
El Paso, Texas  
79912  
October 17, 1983

HQ TAC/DEEV  
Attn: Mr. Alton Chavis  
Langley AFB, VA 23665

Dear Sir:

This letter contains my formal objections to selected material contained within the Revised Draft EIS's for the Valentine MOA and the Reserve MOA. This letter is to become a part of the permanent record for both documents and is to be included in any final or revised EIS's for those areas.

In both EIS's it is alleged that the Worthington health effects paper represents "worst-case." This is not true for the following reasons:

1. With the limited time and library resources available to me I was only able to review about half of the literature published up to 1978 linking loud noise exposure to adverse health effects.
2. The Worthington report is now over five years old. With the recent information explosion in the area of noise pollution and health at least 100 more studies have been published that the Air Force has not bothered to examine.

In order for the Air Force to meet its responsibilities under NEPA to properly represent "worst-case" the following must be done:

1. Review the studies that were not available to Worthington. (Perhaps 50 studies.)
2. Review the relevant recent studies (1978-1983). I would estimate that about 100 more studies are now in the literature.
3. List all studies reviewed in a comprehensive bibliography so that the completeness of the analysis can be evaluated.
4. Provide a revised summary of findings.

The failure of the Air Force to go beyond the efforts of Worthington is inexcusable. To represent the Worthington study as worst-case is misrepresentation for the reasons stated above. This is one more example of how these draft EIS's fail to meet the objectives of NEPA.

Sincerely yours,

*Richard D. Worthington*

Richard D. Worthington, Ph.D.  
Associate Professor of Biological  
Sciences

cc: selected opposing groups.

QUESTIONS AND COMMENTS  
regarding the  
REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENTS  
FOR SUPERSONIC FLIGHT OPERATIONS  
IN THE RESERVE AND VALENTINE MILITARY OPERATIONS AREAS

(Produced by the Air Force  
July, 1983)

Submitted by  
Richard Bargaen, M.D.,  
Box 1445,  
Fallon, Nevada,  
89406.

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Due to the great similarity of the Revised Draft Environmental Impact Statements issued for proposed supersonic flight operations in Reserve and <sup>(DEIS)</sup> Gandy (NV) and Valentine Military Operating Areas, the following comments and questions are submitted for incorporation in the Final Environmental Impact Statements for both areas.

The page numbers, unless specifically noted, refer to the document entitled "Revised Draft Environmental Impact Statement....Reserve Military Operations Area, Holloman Air Force Base, New Mexico."

Due to the small amount of time available for comment on these major proposals, the following comments and questions are focused on a few critical areas of both RDEIS's.

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#### SUMMARY

191 The fact that a Revised DEIS was prepared for the Air Force's proposal indicates compliance with §1502.9(a) of the "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act". This section states, in part...."If a draft statement is so inadequate as to preclude meaningful analysis, the agency shall prepare and circulate a revised draft of the appropriate portion."

191 It is appropriate to note that in this case the entire first 'draft' was revised. The present document, although extensively altered, suffers fatal flaws which render it unable, legally, scientifically and ethically, to form or represent the basis for a final environmental impact statement on the proposal. Hopefully, even though this comment is written hastily in the early morning hours, the data which will be presented, and the questions that will



be asked, will substantiate this conclusion..

Part 1502.17 of the Regulations referred to earlier, states, in part, .... "The environmental impact statement shall list the names, together with their qualifications (expertise, experience, professional disciplines), of the persons who were primarily responsible for preparing the environmental impact statement or significant background papers...Where possible the persons who are responsible for a particular analysis, including analyses in background papers, shall be identified."

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In connection with this point we note that beginning on page 217 of the Reserve hearing, the Air Force refuses to make these names known, other than the statement by a panel member that Captain Gauntt "says he had a hand in it." Pages 218-220—"I don't know who did that."

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On page G-95 of the Valentine RDEIS the comments about the archeological expert are noteworthy. In all, there was no information provided about the persons responsible as required by 1502.17, and probably with good reason. One panel member states that he didn't feel it was necessary for the Air Force to review all the sonic boom literature (c.f. page i—"The Air Force has conducted an intensive literature review..."). As Mark Twain noted, the idea is first to get your facts, then you distort them as you desire.

The comments above, along with the major flaws in these papers, indicate that not only are these documents inadequate to serve as a basis for an EIS, but that the Air Force should take leave of it's closet experts and delegate to an independent technical group the task of producing a paper that, as NEPA requires, must be of "high scientific quality".

It is a harsh statement to say that these documents often appear to be deceptive in intent, but careful review leaves the inquiring layperson with no other conclusion. Residents of the Morenci and Valentine areas may be

certain that their only true recourse is to claim the protection of their Constitutional Rights, and take legal action to stop the implementation of what will be a true, uncontrolled medical experiment on the effects of chronic exposure to sonic booms on human beings. (Page ii—"There is little doubt that noise including sonic booms acts as a stressor, but it is not known with any degree of certainty whether prolonged exposure results in cumulative pathology."

The Air Force conclusion of no significant impact is not legal in the sense of 'Regulation' 1508.27 which states in part....."Significantly" as used in NEPA requires consideration of both context and intensity: (a) ... Both short-term and long-term effects are relevant. (b2)...The degree to which the proposed action affects public health or safety.(b4)The degree to which the possible effects...are likely to be highly controversial.(b5)The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks." (emphasis mine)

Clearly, the Air Force must acknowledge their proposal will result in a significant impact on human beings, by definition of the very Act that moved them to create these documents.

The Air Force needs to maintain the highest standards and efficiency in air combat training. No one questions this need. But the true costs must be tallied. This training can be performed elsewhere, as it is now, and in the type of environment where the impact on human beings will be zero. Again, it should be stressed that there is virtually no possibility that the Air Force will account for the true human costs of these proposals. The citizens' only recourse is to the legal system, based on the Constitutional protections that are the right of everyone, even "six highly annoyed" New Mexicans. This is not a technical problem, it is an ethical and moral issue.

## INTRODUCTION

There are few, if any, regions in the free world where civilian populations are legally subjected to the conduct proposed for Valentine and Reserve, by the Air Force. The Papago Indians are being overflowed supersonically at this time by the Air Force. The resulting structural damage and resulting effects on human health and welfare are considerable. There is at this time no EIS available based on the DEIS for the proposed supersonic flight at SELLS. The point appears to be that even without a Final EIS actions can be taken, as proposed, with impunity. The AF has issued itself a waiver, I assume, perhaps illegally. Residents of Texas and N.M. can take comfort in Col. Smith's statement (Page G-68 Valentine RDEIS) that "...in no way, with what we propose to do here, even by the worst stretch of your imagination, as to how many booms a day you can get, will it compare to what we have been doing to the people in Sells Arizona and the environs there too, for the past several years."

The U.S. Navy has proposed supersonic air combat maneuvers over inhabited regions of Central Nevada. Their DEIS may be issued by November, 1983. One might have guessed that the Navy needs to "maintain air crew efficiency to prevent the degradation of the National Defense posture and for purposes of National Security." The AF intends to sonic boom eastern Nevada in Gandy MOA.

The Board of Commissioners of three counties in Nevada, have all passed resolutions stating their strong opposition to the Navy's proposal. The Nevada State Medical Association has declared its opposition to the proposal on the basis of concerns for the health and welfare of the civilian population. Ninety-seven percent of all the physicians practicing in rural areas of northern and central Nevada, have signed a petition requesting the

government to appoint a technical advisory committee to independently evaluate the data being used and abused to allow the Navy to reach the presumed conclusion that sonic booms produced by low altitude supersonic air combat maneuvers will not significantly impact human beings living below. This petition was instituted upon the clear presumption that much of the data and the interpretation it undergoes, will be misleading, based upon past experience here (and the analagous situation exists in Morenci and Valentine).

Perhaps Nevadans will receive a better quality document. The main Naval coordinator for the Central Nevada MOA, in San Bruno, California, when asked if the documents produced by the Air Force for Morenci and Valentine would be utilized in the Navy's document, replied in the negative. When queried as to the reason, the coordinator commented on the poor quality of the documents. However, this may be a simple case of interservice rivalry.

The largest organization of civil aviators in the world, the Aircraft Owners and Pilots Association (U.S.A.), has declared that the underlying concept of supersonic operations in a Military Operating Area, is hazardous to the safety of all aviators. In an MOA, all pilots, both civilian and military have free use of the airspace upto 18,000 feet above sea level, freely aviating without restriction or hinderance or outside control other than the F.A.R.'s which govern flight in all airspace in the U.S.A. The AF uses the term "set aside" to refer to the SOA. There is nothing set aside in 194 the proposed SOA's, except the limitation supposedly that military aircraft 194 can not go supersonic outside that region. The implications for civilian pilot safety are false however.

Perhaps the only element to be set aside will be the aircraft insurance on the civilian aircraft which operate at their own risk in the SOA. One

major civil aviation insurance company contacted by phone stated that insurance written on a civil aircraft legally flying in an SOA such as proposed, would be invalidated due to the hazardous nature of the activity.

195 The rules of flight in a MOA are "see and avoid". The supersonic activities conducted in these MOA's by the military are legally defined as ultra-hazardous and should be confined to restricted areas. Obtaining a restricted area is a rules-making procedure and the military is avoiding this approach. However, the nature of the activities here would, as AOPA states, create "de facto restricted areas obtained outside of normal legislative channels." These hazards and questions have been glossed over in the present RDEIS's.

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Citizens of Texas and New Mexico complained in the hearings that their numerous petitions to the Air Force and others, went unheeded. In Nevada, numerous petitions have been compiled and forwarded to the government and the Navy, without any results. Citizens in Nevada have filed before the U.S. District Court in Nevada for relief, requesting a preliminary injunction to halt the proposed supersonic bombardment. It should be plain to residents of other rural areas that are similarly threatened, that despite all the talk and pleas, only recourse to the courts will restrain these federal agencies from taking actions that will cause irreparable harm to human health and welfare.

196 By attempting to create SOA's over inhabited regions of the country, the Department of Defense has undertaken a major federal action which is included in 'Regulation' 1502.4, a section dealing with "broad" federal proposals which require an EIS to address the proposed action's effects as a whole, not on a site specific basis. 1502.4c states, in part...."When preparing statements on broad actions (including proposals by more than one agency),

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agencies may find it useful to evaluate the proposal(s) in one of the following ways: 1. Geographically, including actions occurring in the same general location, such as a body of water, region, or metropolitan area. (one notes here that the siting criteria for all military federal agency SOA proposals certainly select out specific rural areas as targets).

2. Generically, including actions which have relevant similarities, such as common timing, impacts, alternatives, methods of implementation, media or subject matter...."

Presently, each SOA proposal is targeted upon a small population by a federal agency, whether Air Force or Navy. The major federal action for supersonic flight over civilian populations clearly requires a 'generic' or 'programatic' EIS, prior to allowing each federal agency to produce its own site-specific version of an EIS. A 'generic EIS' led to the cancellation of the Supersonic Transport overland flights several years ago. The federal government must, before implementing any SOA's over civilian populations, complete a satisfactory generic EIS addressing the central issue as to the hazards to the safety, health and welfare of human beings, and the many associated issues. This issue should be dealt with in the courts if the federal government does not proceed voluntarily in compliance with the requirements of NEPA of 1969.

As the various federal agencies are presently proceeding, each impacted region is dealt with separately. This effectively fragments and mutes any concerted actions of the relatively small groups of citizens in the different rural areas who have been selected by identical siting criteria for what was previously, quite correctly, called an uncontrolled medical experiment.

The ethics and morality of this situation demand redress. Recourse to the courts is the only real means of addressing the issue. Do it yourself.

The EIS that may result from the RDEIS's at hand, will not be reviewed by any capable persons outside of the leading agencies which produced the documents. Certainly the EPA and the CEQ (Council on Environmental Quality) will not produce a scientific critique of these documents. The EPA Region Nine (which includes Nevada) has terminated all their "noise specialists". Budget cuts have affected the reviewing process in all other regions and also other agencies with expertise in this area, such as the F.A.A.

Science, August 5, 1983, page 529...."The Council on Environmental Quality (CEQ) has fallen on sorry times since the days when its halls were thronging with experts, its reports were abundant and much-heralded, and its chairmen had the ear of Presidents...The House Appropriations Committee is particularly unhappy about CEQ. In its report it says that "not a single scientist or technical expert is on the permanent staff," which "renders the Council unqualified to offer substantive contributions or policy advice."... The CEQ is regarded as having performed an extremely valuable function in the past, issuing reports, monitoring the National Environmental Policy Act (NEPA), performing policy analysis, acting as a direct line to the President on environmental issues, and putting out an annual report that contained extensive independent analyses of environmental progress and problems. Now, as far as many observers can see, all that CEQ does is put out tardy annual reports that are little more than justifications of government policies."

In short, the only outside review these RDEIS's will receive, will be from the lay public themselves. There will not be any scientific review by qualified persons of the conclusions presented by the AF and Navy, which perhaps renders the demand for a generic EIS moot in any case.

Finally, after reviewing the first draft EIS and the subsequent revision, my personal opinion is that these documents have arisen from a long

tradition. This tradition is——proceed unless opposition is truly formidable (referring here to bureaucratic types of actions), bring out inhouse experts, and use the Mark Twain rule of EIS creation.

S. Hammon, a senior partner of the Vibration Damage Specialists in Louisville, writing several years ago in the American Bar Association Journal commented upon a document produced by the Air Force, entitled "Sonic Boom Fact Sheet".

Hammon wrote: "When the fact finding bodies are called upon to make decisions concerning sonic booms...in the near future, statutes, precedence, and customs will not exist. If guesswork is to be avoided, dependence must be placed on the opinion of learned experts. I stress Gray's qualification "learned", since there are a host of experts, but only a few who have the basic qualifications to allow them to understand this subject. The greatest offenders in this respect strangely enough, are the two agencies who fly the greatest number of jet planes—the Air Force and the Navy....All reference is to a mythical "they", who remain completely obscure. Most of the attempted answers have summations which are ludicrous due to over simplification and lack of relevancy to the argument, which they pretend to sum up. From the beginning to the end this work is erroneous."

#### DATA BASE

The information upon which the RDEIS's are based is available to the layperson; articles in the scientific literature, books, etc. This is the same information on supersonic flight and its unwanted stepchild, the sonic boom, which the Air Force uses to produce these documents. The statement of the panel member noted earlier, that the AF did not review all the literature



nor was it required to, is unacceptable. Also, as noted earlier, there will not be any independent qualified scientific review of these documents. National security has been raised as an issue in each and every of the SOA proposals, including the two in Nevada. The wording, warning of severe degradation of air crew combat readiness and the subsequent effect on the national defense posture, appears to issue from the same word processor.

There are no citizens who would not make sacrifices that are actually essential for national security. However, numerous deceptions have negated the average rural citizens' instinct in these regards. The primary victim of these RDEIS's are the scientific data. To ameliorate this inbuilt bias, it was suggested earlier that independent, unbiased, technical commissions could be created to evaluate the proposals and the central concept itself. Other organizations also have reviewing abilities such as the General Accounting Office and the Congressional Research Service.

In the pages that follow, several of the fundamental assumptions or interpretations of the AF are questioned, mainly on the basis of the documents that the AF itself has used. A dispassionate review of the scientific literature and the documents produced by the AF leads to the conclusion that the present documents are inadequate as a foundation for an EIS, due mainly to the selective nature of the presentation of evidence and facts and at times to the apparently deliberate distortion of scientific data.

The time required to comment on these documents in their entirety is prohibitive. However, the points made later in this comment paper are not highly selective, that is, the errors and misrepresentations commented upon are distributed throughout the entire AF documents.

### THE LOGIC OF THE RDEIS's

The strength of a structure can be no greater than the strength of its foundations. In the case of the AF documents, the final conclusion of "no significant" impact upon human beings due to low altitude supersonic overflights can be traced back through the literature, and the seminal documents and the scientific foundations can be examined. The conclusions drawn from these documents, which are then used to draw further conclusions etc., then allow us to evaluate the statements and assumptions made in final analysis.

It is instructive to compare the first DEIS with the RDEIS, simply to educate oneself as to the creative interpretation of scientific data. However, concerning ourselves with the RDEIS, the following represents the apparent logic the AF utilized in deriving their final conclusions.

1. The CSEL of individual sonic booms are calculated from expressions utilizing the peak overpressures of a sonic boom.
2. C-weighted DNL are computed from the CSEL of individual impulses.
3. C-weighted day-night levels were derived on the basis of community responses to sonic boom exposure, mainly Edwards AFB and Oklahoma City tests.
4. CDNL are accurate measures of human response to the acoustic impulses we call sonic booms.
5. The EPA, in approximately 1976, proposed the use of a C-weighted day-night level to estimate the response of other communities to large amplitude single event impulsive noises, i.e. sonic booms.
6. Carlson developed a simplified method of estimating sonic boom overpressures created by various types of aircraft and blunt bodies, a paper published in 1978. (Carlson's nomograms already appeared in 1966)
7. On the basis of 21 sorties by the F-15 at Oceana, Bolt, Beranek and

Newman, who have done numerous studies for the military, used Carlson's simplified method to estimate the sonic boom overpressures that were produced at sea level when the 21 aircraft were supersonic.

197 8. BBN then use a table based on a standard atmosphere which reveals that less than one third of the supersonic events produced a sonic boom which could have been detected at ground level. One flight was excluded so as not to bias the final results. 197

9. The long term average sound level at points on the ground was determined by the average CSEL per event, the number of events and a probability factor.

10. BBN used a "rough" approximation that these 21 flights occurred in an elliptical area and through a series of calculations arrived at the resulting sound exposure levels within two concentric ellipses which contained the aircombat maneuvers of the F-15.

11. On the basis of the CSELS for the ellipses, the CDNL's were calculated. (based upon 15 sorties per day, 5 days weekly, 52 weeks yearly, no night time operations and less than one boom per supersonic flight).

198 12. Since the number of "superbooms" could not be calculated by BBN "from the present data", they state that one of the 18 booms reported by residents of Valentine tests (June, 1978) was a superboom. Thus they conclude that "With lack of any other data, in this analysis it is assumed that one boom in 20 reaching the ground will be a superboom." 198

13. BBN determine that superbooms will not affect the CDNL on a long term basis.

14. BBN adjust their calculations for the ground level in New Mexico and Texas and determine that maximum CDNLs to be produced in Reserve or Valentine are scarcely above 61 decibels. No corrections for changes in humidity noted.

15. The Air Force places these ellipses into portions of Valentine and Reserve MOA's and notes that these sound levels are less than those recommended maximums for normal urban residential neighborhoods and that at the most, only five or six citizens will be highly annoyed by supersonic air combat maneuvers in their county.

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In returning to the roots of the data base, the tests at Edwards AFB and the Oklahoma City tests, one is reminded of the strength of the data that is the foundation for the finding of no significant environmental impact in the RDEIS. (from Schomer's paper : "Evaluation of C-Weighted Ldn for Assessment of Impulse Noise", J. Acoust. Soc. Am., Vol 62, No.2, August 1977.)

Even without consideration of studies that show truly rural areas are far more susceptible to the effects of noise, either impulsive or non-impulsive, the OC 'tests' are a very shaky foundation upon which to base conclusions noted in the RDEIS.

Only a few points of many may be noted. Oklahoma City was chosen for these tests because it was an aviation oriented community, experienced with sonic booms. As part of the program, "control of the truth" was exercised in that a massive publicity campaign was conducted prior to the tests to inform the citizens that they would be subjected to sonic booms from overflights that were designed to determine if the SST should be developed. This program was portrayed as of great economic importance to OKC and the entire country. The residents were told that their reactions would be crucial to the development of the SST. The majority of the respondents knew that the test was of six months duration and that a favorable response would help the SST.

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199 Despite these and many other such factors, once the tests began, numerous court actions were taken to force the cessation of the tests due to the impacts of low overpressure sonic booms. Legal actions included both private plaintiffs and the Oklahoma City Council, itself. At this point the numbers of complaints were very high. As the courts declined to offer relief to the plaintiffs (this was a 'test'), the numbers of complaints declined dramatically. It is upon these numbers that we obtain figures showing that overpressures, averaging about 1.2 psf, "annoyed" only a certain percentage of people.

The results of these "controlled" sonic booms are meaningless when applied to the proposals at hand or when extrapolated to indicate the benign effect of long term exposure to high intensity sonic booms. The above is only one of many points that could be made in this connection.

The response of humans to sonic booms is reported in various studies and in the RDEIS in terms of "annoyance". "Annoyance" is a term that has no legal standing. You cannot sue anyone because they have caused you to become extremely annoyed. You cannot claim inverse condemnation of your property because an agency of the U.S. Government has caused you extreme annoyance. The term represents an amalgam of disturbing events, such as interference with sleep, interference with conversation, anxiety and fear engendered by noise or perceived danger, etc. The point is that when an RDEIS claims certain levels of annoyance will occur, no legal or even meaningful statement has been made.

It is noted that all the figures relating to overpressures that "will" occur in these SOA's, are calculated. No measurements were made at Oceana, no measurements were made during the "Valentine Tests", etc. Results are based on 21 sorties from which, on the basis of nomograms, calculations, estimations

and approximations (from aircraft in level flight in standard conditions).

200 Perhaps most indicative of the presumptive nature of the data is the statement by Bolt, Beranek and Newman that "Determining the probability of a superbomb occurring, per aircraft sortie, is not readily possible from existing data...With lack of any other data, in this analysis it is assumed that one boom in 20 reaching the ground will be a superbomb."

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201 The French "Jericho" tests are noted several times in the RDEIS and the bibliography. These researchers went to great lengths to obtain actual measurements of sonic boom overpressures and locations of sonic booms made by fighter aircraft engaged in standard aircombat maneuvers. These researchers, whose evidence was available to BBN and the AF, state: "All aircraft produce at least one focus boom when they start supersonic flight(focus due to acceleration). Military aircraft which make high load factor maneuvers produce focus and superfocus booms all along the supersonic airpath."

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Again, simply one point amongst the hundred that indicate how unreliable the RDEIS is. It would be appropriate to note here again, that in the RDEIS as in the first draft, the terminology relating to superfocused booms is used incorrectly.

The simplified method used by the AF to obtain SOA's should be patented. For the first time in this land one is able to lose Constitutionally granted rights (the freedoms that we are protecting, presumably) on the basis of calculations performed by a simple, handheld calculator.

202 An internationally recognized expert on sonic booms, one who is noted in the RDEIS, told me that the CDNL levels recommended by the EPA and HUD are certainly too high, even presuming that they in some manner measure the true response of human beings to sonic booms.

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In sum, if time allowed, the RDEIS and its substructure could be shown,

item by item, to be inadequate, both as a document that pretends to scientific accuracy and as a legal document from the point of view of NEPA of 1969.

If, as the Air Force states, the sonic boom impacts in Reserve and Valentine would be far below EPA and HUD sanctioned levels for an urban, residential neighborhood, then fly the aircombat maneuvers over the cities. The noise levels, the AF states, could be doubled and still fall within these guidelines. If the environmental impact of the sonic booms is so minimal, then why did the suggestion of residents of New Mexico, to fly all missions over Valentine, cause Air Force Col. Jeff Smith to say "For those who say take it all to Valentine, I find that unconscionable personally." (page 193 of the Reserve RDEIS). If the levels of both areas are so low that even doubling the number of sorties in one area would not cause the HUD criteria to be exceeded, then why does the Air Force indicate that an ethical problem would be involved with this shift?

Finally, as many persons at the hearings asked, why was the question of flying supersonic over inhabited rural areas not raised earlier? After all, and contrary to the impression given in the hearings, these aircraft (F-15 and F-16) became operational several years ago and their supersonic flights at Mach 1.1 have been attained routinely by military fighters for two decades. It should be noted that the F-15 went to Holloman AFB on the basis of the positive finding noted in "Environmental Determination for the Proposed Beddown of F-15/T-38 Aircraft at Holloman AFB, N. Mexico (Oct/76)." The same number of sorties were planned then, as now. Part (c) of the summary states in part: "Supersonic training flights will be increased by the conversion of F-4 to F-15 aircraft. However this air combat maneuver training will take place over the White Sands Missile Range (WSMR) and will not

affect the area outside the boundaries of the WSMR. The supersonic events will increase from 550 to 1300 per year." (? Sic)

#### F-15 Combat Maneuvering

This subject is chosen from many others, simply to illustrate another manner in which the RDEIS is a particularly flawed document, stretching even the laypersons' logical sensibilities to unacceptable limits.

The RDEIS states that aircombat maneuvers will average Mach 1.1, and utilizing the concept of Threshold Mach (calculations only) notes one third of all sonic booms will reach the ground, resulting in no significant impact on the environment. National security will be upheld, the national defense posture maintained and the Air Force crews maximally prepared by air combat training within these limits.

Page 1-3..."The F-15 missions require accomplishment in areas set aside for supersonic flight to utilize the aircraft in a supersonic regime. This flight regime is characterized by increased maneuverability, high G-loads, and high closure rates."

Page 1-9..."By operating in the subsonic flight regime only, pilots are denied valuable experience in the vastly different performance and handling characteristics of the aircraft in the flight envelope above Mach 1.0." (added emphasis)

Elsewhere we are told (the page number escapes me) that because of the advanced design of these aircraft, pilots can slip through Mach 1.0 without noticing, and that the attention necessary to stay at Mach .99 degrades the training mission. Thus it appears that the "vastly different performance and handling characteristics" of the Mach 2.5+ capable aircraft are maximal between Mach 1.0 and Mach 1.1.



Page 4-20..."All participants must decrease altitude to utilize the maximum acceleration and turning of their aircraft." (not quite the straight and level flight of Carlson's simplified method). Aviation Week and Space Technology, May 23, 1983, page 75, discusses the F-15 G-overload warning system. "The warning is continuous until the overload condition is relieved. This system permits the full 9-G limit use of the aircraft, enabling the pilot, whenever possible, to open up the flight envelope."

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Page 8-1..."Due to the advanced characteristics of the F-15, supersonic flight is required if pilots are to effectively employ the aircraft in the role for which it was designed and procured...combat ready pilots would be fully able to explore the aircraft performance capabilities and develop practice and refine sound combat tactics and habit patterns in the supersonic flight regime...". (Most pilots would agree that it is difficult to explore the flight envelope of a Mach 2.5+ aircraft while remaining between Mach 1.0 and Mach 1.1. The quote in the paragraph above is a case in point.)

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Next it is noteworthy that the development of the F-15 through the various models, to the F-15D and the Strike Eagle, have been directed to the objective of creating an all-weather, day-night capable aircraft, with equally great air-to-air and air-to-ground capabilities. This will of course produce great numbers of night flights for training purposes and certain types of maneuvers which will consistently generate large numbers of focused booms. Also, an ACMI like system must be installed in N.M. and Tx..

Referring back to the quote from page 1-3, it must be re-emphasized that there is nothing "set aside" about a SOA, from a pilot's viewpoint. This airspace is freely available to all aircraft, military and civilian—only at supersonic speeds it is transformed into a 'killing ground' that AOPA has correctly labelled an extreme hazard to civil aviation. The RDEIS glosses

stressed repeatedly, that their theoretical figures are conservative, are incorrect. The real atmosphere often focuses sonic booms, the effect being greater at the lower Mach numbers the AF says it will average. Scant, or no attention, is paid to studies which have measured the amplification factors related to rectilinear acceleration; multiple booms created in this fashion; noting the fact that multiple, separate booms are created during turns, and superfocused booms in accelerated turns; amplifications created when the sonic boom envelopes of supersonic aircraft intersect during a pass in opposite directions and during overtaking maneuvers. It is nowhere stated that the focused boom in a turn will be "thrown" from ten to twenty miles lateral to the flight path of the aircraft turning. Audible rumbles, that many scientists term significant, occur for tens of miles lateral to the cutoff. Terrain amplification factors of 12 and greater have been measured. Amplification factors due to being near buildings can result in 4 fold or greater sonic boom overpressures (cf. calculated values). Dynamic amplification factors have been scarcely mentioned, although they constitute an impact of major proportions. Even in straight and level flight, variations of overpressures below and lateral to the flight path vary 3-4x, simply on the basis of unknown factors, presumably atmospheric turbulence. These results are from studies in which actual measurements have been performed.

Even at threshold mach, a caustic is formed. It may not reach the ground but if a resident, or one of the more than 60,000 yearly visitors to this area is standing on a hill, he or she will be on the receiving end of a sonic boom that will be at least two times that of the calculated overpressure.

It might be emphasized that most discussion relates to overpressures, both those measured by others and not used by the AF, or those theoretical overpressures calculated by the AF for this RDEIS. Peak overpressure is one

208 element that is used to judge the impact of a sonic boom, but it is not the  
peak overpressure that is the major correlate with the annoyance expressed by  
persons below. Also the AF assumes a normal distribution of data obtained  
209 from the Oceana sorties. It is clear from their charts that the data cannot  
be normalized in a sense that makes the data a basis for statistical  
predictions.

Returning to page 3-10, one can illustrate several of the previous  
points. One notes that the AF hopes to demonstrate that longitudinal  
accelerations of an aircraft at an altitude and Mach number above cutoff,  
produce relatively small areas of focused sonic booms, that are occasionally  
up to 2 to 5 times the overpressure of normal "N" waves, but that a highly  
stable atmosphere, in their own words, must exist for these events to occur.  
After noting Operation Jericho, the AF states that turbulence decreases or  
dissipates the boom; the AF notes that "the most important point is that the  
210 peak pressure of a focused boom decays more rapidly than in an "N" wave and  
thus the positive impulse is much lower..."

Re-emphasizing that turbulence (i.e. the real world atmosphere) causes  
frequent focusing effects, even for aircraft in low Mach, level flight, that  
peak overpressures are not the major correlate with impact on humans, one  
notes that in Operation Jericho the rise times and the peak impulse of  
focused booms were highly significant and that the true effects of focused  
and superfocused booms are such that amplification factors range from 2 to  
greater than 9. In other words, a focused boom is a focused boom.

211 On page 3-11, the AF states that focused booms do not move along the  
ground as is the case with carpet booms and that the focal zone is fixed. The  
focal zone is fixed only in relation to the position of the aircraft at the  
time the caustic is produced, which is common sense. The focus for the

211 the caustic moves along this region in exactly the same sense as a carpet boom does, before it becomes extinguished. This focal zone is usually the site of two or three separate sonic booms which occur in rapid succession (not to be confused with the 'double boom' of the 'N' wave of a normal sonic boom). These impacts have not been addressed in the RDEIS.

212 As noted earlier, the fact is alluded to, but not stressed, that studies have shown that the area involved with a simple longitudinal or rectilinear acceleration, even at high altitudes, is accompanied by a focused boom and then an associated area in which 4 to 6 multiple booms occur, each equaling the overpressures of the carpet boom. These booms have similar impacts on humans but are not included in the RDEIS.

The AF states that in supersonic turns it is quite possible that sonic booms and focused booms will not reach the ground unless the Mach number and altitude exceed certain conditions. Using tables in the sonic boom literature one can easily determine whether this statement has any meaning other than to deceive.

213 For an fighter such as the F-15 at Mach 1.3 and an altitude of 33,000 feet, production of a focused boom can be avoided if the bank angle does not exceed 10 degrees. This translates into a heading change of 0.4 degrees per second (perhaps a slight overestimation). Thus the F-15 requires six minutes to perform a simple course reversal under the conditions devised by the AF. During this time it would travel approximately 60 miles and exit the neat ellipse, let alone the entire MOA. "Bombers and fighters in sustained supersonic flight have to make at least one focusing turn to fly back to home base because the radius of a nonfocusing turn is far too large to be practical." (Operation Jericho).

214 Page 3-15.... "This is supported by the fact that the tests conducted

in 1968 at Tonapah, Nevada, showed sonic booms with overpressures ranging from 50 psf to 144 psf did not cause direct injuries to the exposed people." Upon reading the paper, one notes that the researchers' main conclusion was their surprise, that when the windshield was blown out of their stationwagon, the glass fragments were propelled outward for a distance of greater than 12 feet. It had been thought that sonic booms caused glass breakage with the fragments dropping neatly at the foot of the window.

Additionally, the researchers noted that the windows of all the campers parked along the low altitude routes, were blown out. By the third day, there was considerable difficulty amongst the scientists taking readings, due to the flinching and stress that occurred, beginning at the time when the aircraft first appeared, let alone the sonic boom impacted.

The AF note that no harm occurred to humans is perhaps diluted by the fact that no observations of any nature were made, other than to note that there was a fullness and ringing in the ears, or a pressure like sensation against the body. Mr. Lord, an environmental expert (AF) stated at the Valen. test hearings (Atch.7.30)..."...I know people, I, myself, have been subjected to 100 psf so I know what it sounds like—I didn't hear for a while afterwards."

To the lay person, this phrasing is reminiscent of temporary deafness. No followup studies were done. It is a fact that temporary threshold shifts are forewarnings, if repetitive, of permanent hearing loss. The AF statement is misleading at best. It is also clearly noted in the paper that the startle reflex, which the AF states will habituate, didn't. There is ample scientific documentation that habituation of the startle reflex does not occur. Where the AF so states, its experts are confusing the orienting reflex with the startle reflex. The eventual result is harm to humans via stress.

The orienting reflex (to much lower levels of overpressure than will occur in Valentine and Morenci) can to a large extent be extinguished.

214 However, longer term studies have demonstrated that "behavioral adaptation" is actually a compensatory mechanism. After a period of 'coping', the human organism decompensates. This has been documented in human and animal studies but is ignored or misinterpreted in the AF document.

214

Page 3-17...The AF states that there are no generally accepted techniques for predicting worst-case, long-term, health impacts from noise exposure. Dr. Worthington is delegated by the AF to represent the most pessimistic views known to the AF. Dr. Worthington has encouraged a scientific overview of the subject. To state that his views are amongst the most pessimistic on the subject of the impact of sonic booms on human beings simply indicates that the AF did not review the literature. The literature is 215 clear that it is only a question of how bad does it get. The AF must address the health effects of chronic sonic boom exposure, in a worst case analysis, as required by NEPA, in their revised RDEIS (the RRDEIS).

215

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Nearly every page of the RDEIS deserves correction. It is unfortunate that farmers, ranchers, housewives, TV repairmen and assorted other commoners have to defend themselves against this misuse of scientific data. The archeological study noted in the RDEIS is close to a farce. Two of ten overflights registered "sonic booms" with overpressures of 0.15 psf or in that neighborhood!! No damage to rocks, but no mention of the rock falls precipitated at other archeological sites by sonic booms, described by others.

Alternatives are required by NEPA to be thoroughly researched. Much of what is presented is misleading or ludicrous. Weekend flights over the WSMR are dismissed on the basis of an "informal survey" of an undefined group at

Holloman AFB, citing the problem with morale should this alternative be accepted. Is it the public's responsibility to provide alternatives? The beddown statement allowed the F-15 into Holloman on the basis that no outside areas would be affected. If the F-15 flies down to 15,000 feet, and the T-38 is engaged primarily in air-to-ground gunnery, then both activities can occur at once in the same airspace with a buffer zone between them. This and weekend flights will account for all desired supersonic sorties and put them over uninhabited land.

The costs of all alternatives may appear large, but that is simply due to the fact that the true costs have not been calculated.

\*\*\*\*\*

The Revised Draft statements issued for Reserve and Valentine Supersonic Operations Areas, are not adequate by the standards set forth by NEPA of 1969.

The concept of supersonic flight at low altitudes for long periods of time over human beings, has never been addressed independently (except for the high altitude SST which was cancelled). The AF documents are deceptive. No competent outside experts will evaluate these documents. The AF overflies the Papago Indians, never having completed the EIS process. As Col. Johnson told the people of Valentine (Atch 7.28) "....There are several other people who have to be asked, the Federal Aviation Administration has to be asked. It's impossible, well, I don't want to say impossible, it's improper for the U.S. Air Force to fly supersonic over any area that has not gone through a coordination process or been okayed up through the legislative level of the Government and the FAA. We get our permission from Headquarters U.S. Air Force and that's who okays it."

There is no doubt that the aircraft should be flown, and the aircrews trained to the maximum of capability. But the Air Force is only able to have its cake and eat it too, by producing a document that deceives those who will bear the impact of the proposal.

The time has come for a totally independent, technically competent group to be formed, a true forum of experts created to evaluate the concept of supersonic flight over human beings, at low altitudes; and/or a Congressional investigation should be undertaken to examine these questions on a nationwide basis and dealing with all branches of the military.

There is little doubt that these proposals will be acted upon regardless of the amount of protest, whether emotional, scientific, or otherwise. The only recourse for the common person is to recall exactly the freedoms that the government agency is working to protect and to use those freedoms to secure a just and equitable resolution of the problem.

If the Air Force uses the present inadequate document as the basis for its final EIS, then citizens should, on their own if necessary, proceed with legal action in order to obtain a permanent injunction to protect their health and welfare, the quality of their lives and the land that they live in. This should be done with the clear understanding that the government agencies involved can attain the same maximum quality of training in other ways, but will not attempt to do so unless they are forced to.



October 6, 1983

Department of the Air Force  
Washington, D.C. 20324

Dear Sirs:

Subj: Valentine MOA

We are VERY much opposed to your supersonic booming of this area!

On June 22, 1978, 1:05 p.m. your sonic boom (s) damaged a house on our ranch located approximately ten miles northwest of Valentine.

We made a claim for the damage, submitting statements of actual witnesses who saw the damage occur to the walls and ceiling at the exact time of the designated sonic boom (s), and presented an estimate to repair the damage in the amount of \$600.00. You DENIED such claim because "the damage was caused by a combination of natural forces and obsolete construction".

After exercising our right to appeal, on April 1, 1981 (After a three year period) you recognized our claim for sonic damage, with a payment for damage in the amount of \$250.00. ONLY 1/3 of the cost of actual damage.

Concrete, Rock, and well maintained plastered adobe houses are deemed the proper structure for this area. The State owned facility, the Indian Lodge, Fort Davis, is constructed of Adobe. The State Capitol of New Mexico is constructed of Adobe.

Adobe houses dominate this area, and these structures have been standing for many years without being harmed by "natural sources and obsolete construction".

This is an area where water is a Ranch's most valuable Asset. Our water tanks are constructed of concrete and rock. We are concerned for all our tanks ( your sonic boom(s) also cracked one of our water troughs). The cattle depend on this water.

217 | We are particularly concerned about the Concrete and rock tank that stands  
| above our house. It is 100 feet in diameter and stands 8 feet deep. It holds  
| lots of water. This reservoir, if cracked or broken, would not only wash  
| our home away but would deprive us of water for the pipelines that supply  
| water over the whole ranch. This reservoir has been here many, many years  
| and the "natural forces and obsolete construction have not damaged it"

217

218 | We are also very concerned about the 4' x 6' hand dug spring and well that  
| is walled in with concrete to a depth of 33 feet. The water stays at a depth  
| level of 12 feet. It holds lots of water. This well supplies our entire  
| ranch, and the 100' reservoir. It also has been there for many, many  
| years and the "natural sources and obsolete construction" have not damaged it!

218

Page Two:  
Valentine MOA  
Cle-Vel Ranch

"Obsolete Construction" and age of a property does not make it less valuable and most certainly does not warrant the ~~Navy~~ <sup>Air Force</sup> the right to destroy such property.

We can not afford to have you damage our property over and over again, especially since you won't honor our full claim and pay us ONLY partial restitution.

219 | Least, but certainly not least! We are very concerned on the impact these nerve shattering booms will have on Human beings. Our 81 year old mother makes her home with us. She is currently under doctor's treatment for nerves and stress.....Your sonic booms can certainly not help her condition but will certainly aggravate it. | 219

This is an area of scenic beauty, peace and tranquility. Even though we know that our country must train to protect us, we feel that there are other alternate areas where there would be less environmental impact.

Sincerely,

*Cleaves & LaVelle McDannald*

Cle-Vel Ranch  
Cleaves & LaVelle McDannald  
P.O. Box 802  
Fort Davis, Texas 79734

Telephone: (915) 426-3340

P.O. Box 595  
Fort Davis, Texas  
October 3, 1963

Headquarters TAC  
DEW Inagley Va.  
23665

Re: Valentine MOA

Dear Sirs:

I am adamantly opposed to the establishment of super-sonic flights in the Valentine MOA just to the west of my home.

This area which is unique in Texas, if not in the entire country, will be spoiled and ruined by hundreds of sonic booms each day. This is not useless desert country but rather a fragile combination of mountains and high desert flora and fauna. Most of the residents here are trying to avoid the stress associated with areas of greater population density. Sonic booms will destroy the peace and quiet which they have found here.

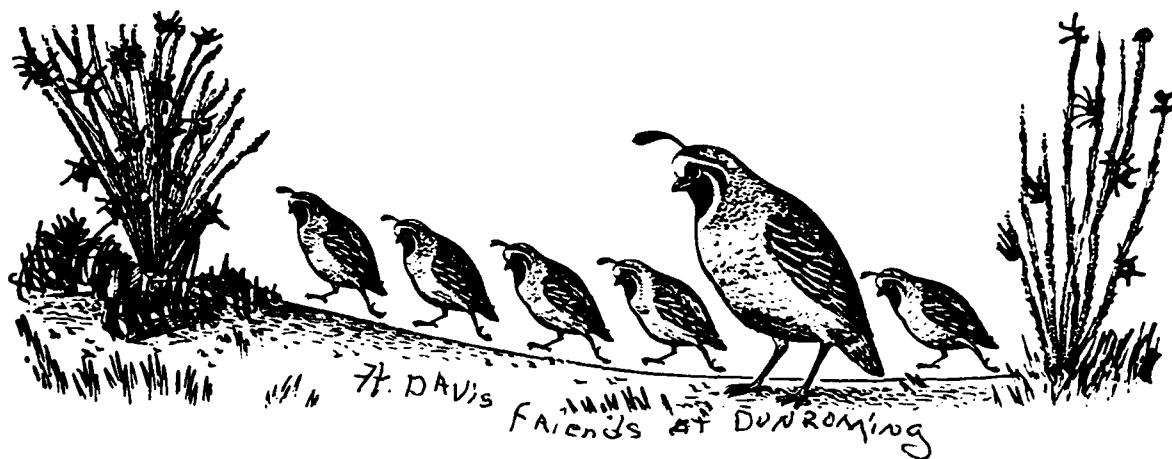
If sonic booms are not distractive to persons, then go do your super-sonic flying over more heavily populated areas, such as Houston, where the booms will be masked among all the other normal noises of the area.

220 As a pilot of some 40-plus years experience, I would also like to comment that the floor of the Valentine MOA is already too low at 15000ft. Aircraft transiting this area often have a need to fly at altitudes above 15000ft. At the very least the floor of this MOA should be above the floor of the Positive control air space, and not even that would make super-sonic flights acceptable. 220

Thank you for allowing me to comment.

*Ned Wilson*  
Ned Wilson

cc; Ralph Voight



1000 Elmwood Drive  
Norman, Oklahoma  
3 November, 1983

HEADQUARTERS, TACTICAL AIR COMMAND/DEEV  
LANGLEY AFB, VIRGINIA 23665

GREETINGS GENTLEMEN OF THE AIR:

AS 3½-YEARS RESIDENTIAL PROPERTY OWNERS IN THE FT. DAVIS, TEXAS, AREA, WE WERE SORRY TO LEARN OF THE POSSIBLE FINALIZING OF SUPERSONIC SORTIES IN JEFFERSON DAVIS, PRESIDIO AND CULBERTSON COUNTIES BY THE 49th TACTICAL FLIGHTS WING AT HOLLOMAN AIR FORCE BASE IN NEW MEXICO. INTERESTED AS WE ARE IN THE QUALITY OF OUR AIR FORCE AND ITS PERSONNEL TRAINING PRACTICES, WE HOPE THERE IS ROOM FOR THE LONG—THOUGH NARROWER—POINT OF VIEW OF THE RESIDENTS ALSO INVOLVED.

WE ARE AMONG THOSE WHO PURCHASED PROPERTY IN THE AREA BECAUSE OF ITS CHARACTERISTICS BENEFICIAL TO ELDERLIES AND RETIREES WITH THEIR PARTICULAR PROBLEMS WHICH USUALLY INCLUDE HEALTH, SECURITY AND FINANCES. THOUGH NOT RETIRED FROM PUBLISHING THE NORMAN TRANSCRIPT, THE HOUSE AND ITS MAGNIFICENT VIEWS HAVE BEEN VERY IMPORTANT AS A HEALTH RETREAT AT 5,000 FEET ALTITUDE AND CLEAN AIR FOR OUR ASTHMATIC/ARTHRIC, AND A REAL HAVEN FROM THE STRESSES OF OUR 75,000, VERY ACTIVE UNIVERSITY OF OKLAHOMA COMMUNITY.

THE HOUSE WE BOUGHT STANDS ON A HILL OVERLOOKING THE LIMPIS VALLEY BELOW. ACROSS THE ROAD IS SHARPS APPLE ORCHARD, PURCHASED MANY YEARS AGO WHEN THE SHARPS FROM HOUSTON SAW ALL THE APPLE TREES IN BLOOM WHILE ON VACATION IN PORT DAVIS BEFORE AIR-CONDITIONING. EVERY SUMMER, THEY HAD RENTED OFFICERS' QUARTERS ON THE OLD FORT DAVIS POST WHICH CLOSED IN 1891, AFTER THE END OF THE INDIAN WARS IN THE WEST. THEIR SON, DUDLEY CRAWFORD SHARP WAS ONE OF YOU DURING THE EISENHOWER ADMINISTRATION. AND WAS VERY CLOSE FRIEND OF COLONEL HAROLD GOULD, U. S. ARMY ENGINEER, RETIRED, WHO WAS DONE ROAMING, ABOUT 1960. HE DIED IN 1980. ENTER THE BELKNAPS FROM OKLAHOMA.

# The Norman Transcript

P.O. DRAWER 1058 / NORMAN, OKLAHOMA 73070 / (405) 321-1800

THE  
NEWSPAPER  
OF THE CITY OF  
NORMAN, OKLAHOMA

PAGE 2

IN NORMAN, WE LIVE EQUIDISTANT FROM BOTH TINKER AND THE F.A.A. LOCATIONS—POSSIBLY TWENTY MILES, TRIANGLED. SOON AFTER BUILDING OUR HOME HERE IN 1952, WE EXPERIENCED SONIC BOOMS FOR QUITE A WHILE, IT SEEMED. THE NOVELTY OF THE NEW, MAGIC BOOMS ENCHANTED US AT FIRST. (WE WERE MUCH YOUNGER THEN, WITH HIGHSCHOOL-AGE CHILDREN. ALSO, WE WERE ACCUSTOMED TO AIR TRAINING AS TWO OR THREE NAVY INSTALLATIONS WERE LOCATED NORTH AND SOUTH OF OUR LITTLE TOWN.)

BUT AS THE BOOMS CONTINUED, THEY BEGAN TO WEAR ON US AND WE BEGAN TO DREAD EACH ONE AND THEN RESENT THE INTRUSION. CONCURRENTLY, PROPERTY DAMAGE COMPLAINTS BEGAN TO APPEAR IN THE NEWS STORIES AND IN THE COURTS, AND TESTS WERE MADE TO PROVE AND DISPROVE CLAIMS OF TINY CRACKS IN WINDOWS AND INDOOR PLASTER: VAGUE SEPARATIONS BEGAN OF WINDOW AND DOOR FRAMES: LOOSENED BRICKS, STARTLED ANIMALS, AND ALL THE OTHER LITTLE THINGS THAT DID NOT REALLY MATTER UNTIL THE SUM OF THE WHOLE WIDENED WHAT HAD BEEN ONLY SLIGHTLY BOTHERED.

THE CRITIQUE WAS SENT US WHICH WAS PREPARED BY THE COUNCIL FOR THE PRESERVATION OF THE WEST TEXAS FRONTIER in response to the AIR FORCE'S DRAFT ENVIRONMENTAL IMPACT REPORT. IT UNDOUBTEDLY COVERED ALL OF THE FACTORS OF PARTICULAR IMPORTANCE TO THE DIFFERING PEOPLES OF THE AREA AND SHOWED THEIR APPREHENSIONS OF COMING PROBLEMS WHICH THE PROJECTED SUPERSONIC BOOMS COULD BRING. ENTER STRESS.

DR. HANS SELYE, INTERNATIONAL AUTHORITY ON STRESS, BELIEVED THAT IT IS NOT WHAT HAPPENS TO US, BUT HOW WE REACT TO THE HAPPENING. REACTIONS BASED ON BEING FORCED TO LIVE WITH SOMETHING BEYOND PERSONAL CONTROL WHICH UPSETS, OFFENDS, AND THREATENS ARE DEEPLY EMOTIONAL AND FAR-REACHING. THE TEXAS NATIVES, THE LONG-TIME RESIDENTS, AND THE NEWCOMERS WHO HAD SOUGHT AND FOUND THE QUIET SERENITY OF THE CHIHUAHUA DESERT MOUNTAINS AND VALLEYS IN THE BIG BEND COUNTRY, ALL FELT THE IMPENDING LOSS OF THINGS IRREPLACEABLE.

WE BELIEVE YOUR STATEMENT IS INACCURATE THAT THE OVERFLIGHTS AND SUPERSONIC BOOMS WOULD HAVE NO ADVERSE HEALTH EFFECTS ON HUMANS, OR SIGNIFICANT PROBLEMS FOR DOMESTIC AND WILD ANIMALS. (UNLESS, OF COURSE, YOU WERE REFERRING TO BROKEN LEGS.)

STRESS IS AN OLD WORD. BUT IT IS USED TODAY IN A DIFFERENT REALTIONSHIP. DR. HANS SELYE'S RESEARCH AND CONCLUSIONS OPENED THE MINDS OF THE MEDICAL FOLK

TO THE PROBABILITY THAT STRESS IS A VERY ACTIVE CONTRIBUTOR IN MANY OF THE HEALTH PROBLEMS THEY SEE IN THEIR PATIENTS. AMONG THEM IS OUR SON, HAL, WHO IS A BELIEVER.

WE DO NOT KNOW WHAT STRESS IS. IT IS INVISIBLE. IT CANNOT BE MEASURED IN THIS RELATIONSHIP. IT IS INSIDIOUS, AS DR. SELYE BELIEVED, AND REACHES INTO MYSTERIOUS CRANNIES OF THE PERSONALITY, WHICH WE ALSO DO NOT KNOW MUCH ABOUT. IT IS THE GREAT UNKNOWN IN ALL FACETS OF TODAY'S SOCIETY, AND TOUCHES US ALL IN SOME FASHION, SOMEWHERE, TO SOME EXTENT. IT IS REAL BECAUSE IT CAN REASONABLY FILL GAPS IN EXPLANATION, SO IS USEFUL LIKE OTHER BASIC ASSUMPTIONS.

221 IT IS POSSIBLE THOSE MOST SENSITIVE TO EVENTS PRODUCING STRESS REACTIONS ARE THE OLD AND THE VERY YOUNG BECAUSE OF THEIR INABILITY TO CONTROL MUCH IN THEIR LIVES, AND BECAUSE THEY ARE OFTEN THE RECIPIENTS OF BACKLASH FROM OTHER TROUBLED FOLK, THEIR SUPERIORS, AS IT WERE. FOR THESE REASONS, WE BELIEVE THE AIR FORCE MIGHT LIKE TO REVISE ITS STATEMENT OF "NO ADVERSE HEALTH EFFECTS ON HUMANS" IN ITS ENVIRONMENTAL IMPACT REPORT. 221

THE LURE OF THE WEST IS UNCHANGED SINCE THE FIRST WHEELED VEHICLE WAS HAULED FROM ST. LOUIS ALL THE WAY TO THE WEST COAST IN 1840. BUT FOR DIFFERENT REASONS. THEN, THE HOMESTEADERS PASSED UP THE VAST CHIHUAHUA, GREAT AMERICAN AND OTHER DESERT LANDS BECAUSE THEY WERE UNFIT FOR FARMING. TODAY'S HOME SEEKERS ARE OF A DIFFERENT TYPE AND FAR MORE FRAGILE THAN THOSE WHO SETTLED THE IN-BETWEEN FROM SPAIN'S FLORIDA TO MEXICO'S CALIFORNIA AFTER THE LOUISIANA PURCHASE IN 1893. MANY OF TODAY'S MOVERS ARE SEEKING ESCAPE FROM THE COMPLICATIONS OF CITY LIVING LIKE CRIME, NOISE, TRAFFIC, OVER POPULATION, WEATHER AND COST OF LIVING.

MANY CAME AS VISITORS TO THE BEAUTIFUL DESERT COUNTRY AND RETURNED TO BECOME RESIDENTS OF THE TINY TOWNS SPRINKLED IN THE HILLS TO THE MEXICAN BORDER. THEY LOVE THE PEACE AND QUIET, THE PRIVACY, THE HEALTHY CLIMATE, A MORE LEISURELY LIFE STYLE. THESE NEWCOMERS, NOT RICH, NOT DESTITUTE, HAVE TRANSPLANTED HAPPILY TO THE SEEMINGLY ISOLATED AND EMPTY SOUTHWEST CORNER OF TEXAS. THEY ARE OFTEN RETIRED EDUCATORS, PROFESSIONAL AND BUSINESS PEOPLE, FORMER COMMUNITY LEADERS, AND ARTISTS, MUSICIANS, WRITERS. THEY MAKE FEW DEMANDS ON THE TINY TOWNS AND STAND BY TO SUPPORT THE ORGANIZATIONS, INSTITUTIONS AND GOALS OF THE TOWNS. THEY HAVE INVESTED IN HOMES AND PLAN TO STAY AS LONG AS HEALTH AND FAMILY CIRCUMSTANCES ALLOW. THEY LOVE THIS HEALTHFUL COUNTRY WITH ITS WEATHER SO AGREEABLE, ITS SUNSETS SO MAGNIFICENT, AND ITS RAINBOWS SO GLORIOUS.

THIS PART OF THE REPUBLIC OF TEXAS ANNEXED BY THE UNITED STATES OF AMERICA FOR ITS 28th STATE ON DECEMBER 29, 1845, CAUSING THE WAR WITH MEXICO IN 1846-48, IS STILL VERY WORTH FIGHTING FOR. BEST OF ALL, WHEN THE SNOWS COME, THEY DON'T STAY...THEY QUICKLY MELT AWAY!

MOST CORDIALLY YOURS,

HAROLD R. AND LUCILLE S. BELKNAP  
OF DUNRÖMING  
FT. DAVIS, TX.

# INTERNAL MEDICINE ASSOCIATES

Diplomates American Board of Internal Medicine

HAL R. BELKNAP, M.D.

BRUCE A. NAYLOR, M.D., INC.

J. KIN PIRTLE, M.D., INC.

November 2, 1983

Lucille Belknap  
1000 Elmwood  
Norman, OK 73069

Dear Mom:

Here's a note I found in the AMA News about one of your mentors. Thought you'd be interested.

Love,



Hal

HRB:sh

Enclosure

## Stress caused stress expert's death: widow

The widow of Canadian stress expert Hans Selye, MD, PhD, has sued the Quebec government, claiming that stress caused by provincial tax collectors hastened Dr. Selye's death last year.

Dr. Selye, who died at home at age 75, gained world renown for labeling stress as a syndrome common to many illnesses, from insomnia to hypertension, indigestion, and headaches.

In a suit filed in Quebec Superior Court, Louise Drevet-Selye said that the physician went into shock in 1981 after a search by revenue officials of his home and offices of the International Institute of Stress, which he founded. Many of his research files were seized, and Dr. Selye was told he would have to pay an additional \$600,000 in taxes for the years 1974 through 1977.

Dr. Selye lost his voice, and his health began to decline after the raid, the suit charges. It also charges that the tax claim was erroneous and damaged the physician's reputation. The suit seeks \$600,000 in damages.





TRANSCRIPT OF PROCEEDINGS OF THE  
PUBLIC HEARING ON THE  
DRAFT ENVIRONMENTAL IMPACT STATEMENT  
SUPERSONIC FLIGHT OPERATIONS  
IN THE VALENTINE MILITARY OPERATIONS AREA  
HELD ON 11 OCTOBER 1983, AT 7:10 P.M.  
IN VALENTINE, TEXAS



Colonel Ratcliff: I am Colonel Kenneth Ratcliff. I am the Chief Judge for the Third Circuit of the Air Force Judiciary and I have been assigned the responsibility of conducting this public hearing on the Draft Environmental Impact Statement which has been filed by the Air Force with the Environmental Protection Agency. Contained in the draft is the proposal of supersonic flight operations in the existing Valentine Operations area located in the Trans Pecos region of Southwestern Texas.

My role in this proceeding is simply to conduct the hearing. My past experience has been judicial in nature and I have not been involved in this particular matter at all and though I have some knowledge with regard to it, I have not been involved with regard to the details of the matter. Further, it will not be my responsibility to make any kind of decision. I will not be making any type of recommendations as far as this proceeding is concerned. And, of course, I have not, as I say again, participated in the development of the project. And though I am a legal officer and as I indicated, a judge for the military, I have not rendered any legal advice with respect to this project at all.

Basically, the purpose of this meeting is, of course--it is intended purposely to be public in nature and of an informal nature to fully accomplish the purpose which it has, and that is

to consider the enviromental impact of the proposed project. Now, this is accomplished bascially by two different means. One is by a briefing to be given to you by Air Force personnel. That of course, will be the very first step in the proceedings this evening. And then, the second part of this is to provide you an opportunity to present your views to the Secretary of the Air Force on the environmental impact on your community which would result from the supersonic flight operations. In fact, it might be well for me to reiterate that for you, and that is, we wish to hear your views with regard to the environmental impact on your community which would result from the supersonic flight operations.

Now, your views will permit the Air Force to receive representative samples of public opinion on the proposed action and thus we will be able to weigh your opinions, the facts that you have, in ultimately making the decision.

As you will notice, we have a reporter who is present, Ms Krallman, and she will be taking down everything that is said in this proceeding. A transcript of this hearing will be forwarded to the office of the Secretary of the Air Force for use in preparing the Final Enviromental Impact Statèment, which of course, is used in the decision-making process.

Likewise, with regard to any of the statements that are made this evening, or any written statements that are submitted, these will likewise be made a part of the record, so we need to keep that in mind.

At this time I am going to introduce those members of the Air Force and the civilian members, employees of the Air Force who are with us this evening. I would ask that as I mention each name, if they would just briefly rise in order that you might see just exactly who the individual is that I have identified.

We have with us this evening Colonel Stamm, who is the 49th Tactical Fighter Wing Deputy Commander for operations and he is representing the Commander of the Wing, Colonel Chambers.

We have Colonel O'Conner, from Headquarters Twelfth Air Force, the Director of the Operational Services.

Major Poli, who is from the Headquarters Tactical Air Command, the Environmental Planning Division.

Also, from Headquarters Tactical Air Command, Major Miller, who is with the Airspace Management.

And Mr. Chavis, who is with the Environmental Planning Division, from the same headquarters.

From Headquarters Twelfth Air Force, we have Mr. Thompson, who is with Airspace Management.

Lieutenant Colonel Tate is the Public Affairs Officer with the 833rd Air Division at Holloman. He is standing in the very center of the auditorium, at the rear.

I might indicate, with regard to Lieutenant Colonel Tate, he being a Public Affairs Officer, if there are any questions that are to be posed, such as by the news media, he is the individual that will be the spokesman on behalf of the Air Force.

We have also from the 833rd Air Division at Holloman Lieutenant Colonel Lloyd from the Airspace Management.

From the 49th Tactical Fighter Wing, Major Graham, who is the Executive Officer, and he is project officer this evening and in a few minutes will be providing a briefing for you.

From the Legal Office of the 833rd Combat Support Group is Captain Flanagan.

And, I have already mentioned our reporter, Ms Krallman.

We also have the public address operator, Airman Haskett.

Basically, the order in which I intend to proceed this evening is first of all for us to have the briefing which will be given by Major Graham.

Following this, contemplate that we will have time for questions and answers and I will go into this in greater detail with regard to some of the ground rules that we will apply with regard to these questions and answers. And then, ultimately of course, we will have an opportunity for you to make such statements as you might desire. I would indicate that this podium, which is over here to my right, I will ask that it will be used by those who will ultimately be speaking. And, as the occasion may arise, for members of the Air Force panel as may need to speak, if they would use this podium here to my left.

As I have already indicated and announced, if you have a desire to make a statement, once again, if you haven't gotten one of these forms, again, please hold up your hand and obtain one and fill it out as soon as you can.

Copies of the transcript of this hearing and the Final Environmental Impact Statement will be sent to those individuals who have participated through the filling out of the form and making the public statements here this evening. Those who are otherwise here who may desire a copy of this transcript, you can obtain one at a reasonable cost for the reproduction. And I might add, otherwise, in this regard to this there are copies which will be placed at particular locations within the community and if need be we can provide you with a list of those locations.

When it gets time for the statements, I will mention it now and remind you of it later also, and that is that the statements, if you're representing a group, the statement time will be limited to ten minutes. If the statement is simply on your own behalf then your time will be limited to five minutes.

I would ask anyone who speaks, that the first thing that you do, of course first of all, that everyone use the podium here and the microphone so it can be very clearly heard so the reporter can be sure and get it down. The first thing I would like to have you indicate would be your name and your address and this will greatly facilitate the conducting of the proceeding in an orderly manner.



At this particular time, I believe that I have at least hit on the important preliminary comments that needed to be made and Major Graham, are you ready at this time to proceed with the briefing?

Major Graham: Yes.

Good evening ladies and gentlemen. This is a heck of a way to come back home to Texas - come to the schoolhouse.

(35 mm Slide) I am glad to be able to present the Air Force position about why we want to fly supersonic. I am from the 49th Tactical Fighter Wing, stationed at Holloman Air Force Base, in Alamogordo, New Mexico.

(Slide) The 49th is one of two wings in the 833rd Air Division at Holloman. The other is the 479th Tactical Training Wing and you will hear me refer to that during the briefing.

(Slide) The reason we are really here tonight, is this airplane. The F-15 is flown by the pilots of the 49th and we have seventy-two F-15s. It is the premiere air superiority fighter in the world. In other words, it is designed to shoot down other airplanes in air-to-air combat. It is extremely maneuverable. It

flies high speed, it also flies well at low speeds and has extremely sophisticated avionics - the radar components, the navigation.

(Slide) This is our mission. In a nutshell - our mission is to be able go anywhere in the world on short notice, once there, to defeat any enemy air traffic in the skies and to win the battle in the air.

(Slide) We also maintain two aircraft at Holloman on alert in the North American Air Defense Command which defends the airspace over the United States and Canada, seven days a week, twenty-four hours a day.

(Slide) As I said, we mobilize. We gather our equipment and load it on a cargo aircraft. We deploy and fly non-stop from Holloman to anywhere in the world. This picture was taken on a deployment off the east coast of England--excuse me, west coast of England, on the way to Germany.

(Slide) In the theatre of operations then, we employ the F-15 against other aircraft, strictly in the air. As I said, we keep two aircraft on alert, two pilots, and crews to maintain the aircraft and we're ready to respond on short notice at any time.

The aircraft is generally used in this area to help an aircraft in distress. It has been used to track drug smugglers and they have also been used to shadow a high-jacked airline.

(Slide) Why do we need to fly supersonic? You can see the reasons listed up here. The bottom line, "formal training", and the reason we're here tonight, is that we need it for our proficiency training.

(Slide) Why do we need supersonic training in order to be proficient? Some of the reasons you see up here - recognition times and the closure rates, things happen at a much faster speed. Aircraft are closing faster and you have to be able to think faster. You develop certain habit patterns, depending upon the speed you operate. Driving your car down the highway at fifty-five is not quite the same as operating in the Indianapolis Five Hundred, and the same things apply in a jet fighter. You need to be able to operate at faster speeds and have your habit patterns adjusted to those speeds.

(Slide) The airplane also performs differently at higher speeds. The pilots have to know how to handle the airplane throughout the operating envelope from low to high. It is extremely important to operate at the highest speed regime and the

reason is that an attack, it has been proven in combat, and proven in training exercises, that the people who are able to operate at high speeds are the ones that were able to destroy the enemy aircraft and come back alive.

(Slide) Our need is for twelve hundred supersonic sorties a month. Right now, we fly all our supersonic training on White Sands Missile Range near Holloman. On a long term basis, White Sands can only handle about six hundred sorties a month. Some months, we get more and of course we use it when we can. That leaves us six hundred sorties every month, which we need to find a place where we can fly at supersonic speeds.

(Slide) To comply with the Air Force policy, you will see: "...to the maximum extent over water". We have a problem with that at Holloman. "Over land", normally "above thirty thousand feet". However, because of our training requirements, we need to operate at lower altitudes. Therefore, we are seeking a waiver to the Air Force imposed restrictions.

(Slide) The airspace we looked at, airspace within a hundred and fifty miles of Holloman, which is our normal training range, that we have enough fuel to go out and to come back and still have time for our training. We want to have minimum impact

on the other operations. We are looking for a sparsely populated area so we will minimize the impact to the people on the ground and we need a large enough area because of the characteristics I referred to, the radar and the long run and the high speed, we do need a larger area, and we did not want to affect existing operations.

(Slide) We looked at a lot of alternatives trying to find airspace in which to fly our supersonic training. We looked at operating from Holloman and using air refueling, to use the existing supersonic airspace, or to deploy from Holloman and use that same airspace. The problem that we came up with in every case was the area was already saturated with other users. Even when we can get in, operating from Holloman requires us to air refuel and there is a lack of tanker support and it would be extremely costly for us to operate.

(Slide) We then looked at all the airspace around the Holloman area. Here you see two circles. One is a hundred mile circle and one is a hundred and fifty mile circle. The T-38s from Holloman are fuel limited and are restricted to about a hundred mile area. They have to use the areas close to Holloman. We do have the use of White Sands Missile Range which is nearly--the rectangle right here in the center of the area. White Sands Missile Range is a national test facility. Its primary mission is

missile research and development. We can only get in there on a space available basis. Many of you think that the White Sands is all government land and I've heard a lot of people say, "fly all your sorties there". Part of White Sands is totally owned by the government. The northern part, where we do conduct supersonic operations at the present time, is privately owned land. We do have an assessment to fly supersonic in the area. We also looked at the Pecos MOA, in the righthand corner, but because of the airliner routes going into Texas we were unable to get the vertical requirements for airspace that we needed. It came down to the only airspace available, was the Valentine area and the Reserve area, in western New Mexico.

(Slide) We looked at some other alternatives as well - using Mexican airspace. Because of the Mexican constitutional restrictions, we were unable to work out an agreement with the Mexican government to use any of its airspace.

We looked at a place that we could establish new airspace. In fact, this Valentine Military Operations Area, there was new airspace established for our Wing and has been used up to the present for subsonic operations. Looking at all the other areas around Holloman, to fit in some new airspace, we found we couldn't.

If you use only the White Sands Missile Range, the acronym up there is WSMR, and the Reserve area, the Reserve area is used by other units and we could not get all the sorties we require by flying only in Reserve. We looked at using White Sands and Valentine and we can get all the sorties that we need here in Valentine, six hundred. However, because of our operational flexibility and an effort to divide the impact into two areas we would prefer to use both the Reserve and Valentine area.

Changing the priorities on the White Sands Missile Range. As I said earlier, White Sands is a National Test Facility and it is the overland missile range and there are a lot of high priority testings going on out at White Sands at present and that's expected to increase somewhat in the future. So we cannot get in to change the priority on White Sands. We are unable to make any changes.

Weekend flying on the Whites Sands Missile Range - it's another alternative we looked at. There's still testing going on there on the weekends. We could fly some more sorties but we could not meet all the requirements that we still have. We would fall short of our six hundred.

As I said, it came down to the Reserve area in western New Mexico and the Valentine area here.

(Slide) We made several changes in order to reduce the impact of the sonic booms. We took away a portion of the eastern section of the Military Operations Area and removed some of the McDonald Observatory and removed some of the Fort Davis area. We changed the minimum altitude to fifteen thousand feet above sea level, which is eight to ten thousand feet above the ground. Over the White Sands Missile Range we fly at five thousand feet above the ground, which is two to three thousand feet above the terrain, above the people. Here we are limiting it to a higher altitude in order to reduce the impact. We said no supersonic flights within five miles of Valentine.

(Slide) This slide shows the area that we removed from the eastern portion and the five mile circle around Valentine.

(Slide) Finally, we also located our primary maneuver areas as we call them, in the least populated portions of the area. By using our internal navigation system and our references on the ground, we are able to keep track of where we are on the ground and by setting our flights up our studies have shown that we can confine, for the most part, the sonic booms to the areas we choose.

(Slide) These are our primary maneuver areas.



(Slide) In compliance with the Environmental Protection Regulations we are holding this public hearing. There is also a public comment period in which you can write and that closes on the 4th of November. Following the public comment period, we will take all the comments that are given here tonight or submitted in writing, and we are going to answer them in a Final Environmental Impact Statement. We will send the final report to all the federal, state and local agencies and any interested individuals and you will have a chance to review it. There are thirty days for additional comment on the final statement. Following that, the final statement, plus all the additional comments goes up to the decision maker who is a civilian in the Secretary of the Air Force's office, for him to either approve or deny. If approved, there is another thirty-day waiting period before we can implement our proposal.

That concludes my briefing.

COLONEL RATCLIFF: Thank you, Major Graham.

At this time we will proceed with the questioning and answering portion of the proceedings. Let me outline some aspects with regard to this area so as to hopefully provide a better understanding of how we desire to proceed.

Basically, it will be desired that the questions be of the nature of exploring into areas that you feel need clarification, and especially, within the area that would pertain to the Air Force mission that has just been discussed with you in the briefing.

This being a time for questions and answers, it is not the time then for statements. We will come to that point a little bit later on. Likewise, in the process of answering the questions, and of course, the asking of the questions, it is not my intention for a dialogue to develop between the person who is asking the question and the one who may be speaking. Perhaps to be more specific, this is not a time for cross-examination, nor is it appropriate for us to be dealing with questions that might be argumentative in nature. It is the desire that it be a time for trying to clarify areas that I assume are an issue with you and you feel at this point has not been answered.

In some instances it might be that a question would seem to be inappropriate and if I consider it to be such, then I will indicate in effect that it just won't be answered at this time. It may well be that the question that you have posed, the answer is not known. Your questions, of course, will be a matter of record, but you will not get an answer, obviously, to it this

evening. Although we have got some very knowledgeable people here, I suspect that you have some questions that maybe nobody can answer at this time. We just don't know.

It may very well be of course, that you may raise a question that cannot be answered but would be a very pertinent one for somebody to look further into and that's one reason we are allowing this time for the questions and answers.

Because of the nature in which I intend to proceed then although, as I have indicated, by no means do I consider myself knowledgeable really as far as the details are concerned, but I am going to ask that all questions therefore be directed to me and then we will determine who and in what manner the question will be answered or whether they will be answered at all this evening.

I might reiterate with regard to this proceedings, of course, and one reason that I have made some of the statements that I have as to the approach to the questions and answers is that this is not an adversary proceeding. This is a period for the purpose of giving you an opportunity to express your thoughts and thus, not a time for a debate, not a time for a controversy of any kind or for any argument or anything that would be argumentative in nature to develop. And I would mention once

again, that this is the time primarily to get your input as it relates to the environmental impact of the proposal.

As I indicated earlier with regard to the proceedings, I would ask that anyone who wishes to pose a question, if you would, come to the podium and indicate your name and your address and then if you would, kindly pose the question. This will ensure not only that the reporter gets all the pertinent information, it will make sure that everyone very clearly hears just exactly the question that has been posed. We will try to do this in an orderly manner, and to the extent possible, I will try to recognize those individuals who hold their hands up first that indicate that they desire to pose a question at this time.

Alright, I have one hand, would you please come to the microphone and give your name and address.

MR. CINOTTO: My name is Richard Cinotto and my address is Box 277 Valentine.

COLONEL RATCLIFF: Would you indicate your name again, there was a disturbance there.

MR. CINOTTO: Richard Cinotto. My question here is to, I guess, to Major Graham, on this briefing. Somewhere along in the briefing I thought I heard you say that you fly supersonic missions at Holloman Air Force Base. Is that--do you fly supersonic missions at Holloman?

COLONEL RATCLIFF: Alright, the question of course, again, I will ask that even though somebody else will no doubt end up answering the question, the questions should all be posed to me.

MR. CINOTTO: I'm sorry. I beg your pardon. He started out with the briefing and I thought we could ask questions as to the briefing that he presented. That's what I was doing, was asking him a question of a statement that he made in the original briefing that we all had to listen to.

COLONEL RATCLIFF: I'm very likely going to be turning to him.

MR. CINOTTO: Okay, I understand now. Okay, sir, I have a question. I believe I heard Major Graham say in his statement that they were flying supersonic missions at Holloman at this time, at Holloman Air Force Base. Is that correct? Is the Air Force flying supersonic missions at Holloman at this time?

COLONEL RATCLIFF: Alright. Major Graham, can you answer that, or does somebody else need to?

MAJOR GRAHAM: Yes sir, that is correct, we fly supersonic missions over White Sands Missile Range.

MR. CINOTTO: Well, in your statement, I mean, as you said in the briefing though, unless--maybe there's a way we can play it back or something, I thought that the statement that he made was that they fly supersonic missions at Holloman Air Force Base. You fly supersonic missions out of Holloman but not at the Air Force Base? That's my question, sir.

MAJOR GRAHAM: That's correct.

MR. CINOTTO: Now you say you fly that--you made a statement that--oh, back to you sir.

COLONEL RATCLIFF: Okay.

MR. CINOTTO: I have another question. In the briefing that he made, he said that at the White Sands Missile Range, when they do fly supersonic missions that it is at 5,000 feet msl, I believe that was approximately the figure. And he said 5,00 feet

msl, which is two or three thousand feet above the people. My question is, do people live in the White Sands Missile Range? I thought that that was pretty much a free-fire zone. I didn't know that there were actually residents in the White Sands Missile Range.

COLONEL RATCLIFF: Alright, then your question is, do people live in the White Sands Missile Range?

MR. CINOTTO: Under which they do their present supersonic.

COLONEL RATCLIFF: Alright, Major Graham.

MAJOR GRAHAM: I did make a mistake. It's five thousand feet above the ground at White Sands Missile Range. There are two portions of the White Sands Missile Range.

There is the restricted area which is totally owned by the government and then there is a northern portion which is privately owned land.

MR. CINOTTO: And it's designated restricted 5103 Bravo and Charlie?

MAJOR GRAHAM: 5107 Charlie.

MR. CINOTTO: 5107 Charlie.

MAJOR GRAHAM: Which is civilian privately owned land.

MR. CINOTTO: Now, that's way north of it?

MAJOR GRAHAM: No, it isn't. Part of the White Sands Missile Range is called the firing extension. The White Sands Missile Range has a contract with the residents in that area to evacuate during missile tests. However, it is environmentally assessed for supersonic flight, and we do fly supersonic in that area.

MR. CINOTTO: Okay, that answers my question. That's all I wanted to know.

COLONEL RATCLIFF: Thank you, very much.

Is there anyone else at this time who desires to pose a question?



MR. YORK: Darrell York, Box 536, Marfa. I believe you all told us that you will conduct supersonic flight sorties, only during the daylight hours and only on weekdays, is this correct?

COLONEL STAMM: That's correct.

MR. YORK: The question then that I would like to ask is, how many hours, day or night, how many days a week are subsonic flights planned? In other words, how many subsonic flights, day or night, how many a week, how many hours, and also, how many supersonic flights are planned per hour, per day, per week, per month? Night or day?

COLONEL RATCLIFF: Let me indicate first, for the benefit of the audience that may not have heard, Colonel Stamm indicated the response to the first question that was asked was "yes".

Alright, does any member of the panel have the information that has just been asked for at this time.

MR. YORK: Could we take the subsonic flights first?

COLONEL RATCLIFF: Alright. Let me first of all find out whether we are going to be able to answer that or not. Do we have a panel member who knows the information? Major Graham.

MAJOR GRAHAM: If you'll take those questions one at a time I'll try to answer them.

MR. YORK: Right, I've got them A, B, C, here. On the subsonic sorties, how many are planned at night, per hour, per day, per week, per month, on the subsonic?

MAJOR GRAHAM: Did you say at night or just total?

MR. YORK: The first question, at night, how many are planned.

MAJOR GRAHAM: I really can't answer at night. We fly night sorties one week every month, which totals about up to thirty a night. No more than that. And we use the Valentine area occasionally.

MR. YORK: Okay. So, in other words--we have heard them at night, so this is you all, right?

MAJOR GRAHAM: It may well have been.

MR. YORK: Okay, that pretty much answers how many a month.

MAJOR GRAHAM: In daylight we fly up to three hundred sorties a month total.

MR. YORK: Three hundred sorties a month.

MAJOR GRAHAM: Subsonic sorties at the present.

MR. YORK: And how many in our area?

MAJOR GRAHAM: I'm sorry, in this area--up to.

MR. YORK: Okay, in this area. On the supersonic sorties, I believe we covered that, as of now, as of today, none are planned for night, is that right?

MAJOR GRAHAM: No, sir, that is correct. We do not plan--the Environmental Impact Statement says daylight hours only and we will comply with that.

MR. YORK: Okay, how many are planned per day, per week, per month, as of now? What are your projected plans?

MAJOR GRAHAM: Let me work backwards on that. Three hundred per month, up to three hundred per month. That really puts about fourteen to fifteen per day, per weekday. We normally fly and fly four, four aircraft together, so you're talking about four times during the day for a thirty minute period there might be airplanes in the area.

MR. YORK: Okay, I believe that pretty well covers it. Thank you.

COLONEL RATCLIFF: Thank you, Mr. York.

I thought just as I was recognizing Mr. York just a moment ago, that there was also another hand that was up.

Alright, yes, sir.

CLYDE ANDERSON: My name is Clyde Anderson and my address is Valentine, Texas.

I would like to know if there is some kind of provision that offers the civilians and the residents in this area in the proposed statement some form of policing the kind of activity that is proposed, if it is instituted and the training procedures are

followed out, if by any chance they tend to get a little out of hand, as sometimes things do, I would like to know what recourse or what kind of procedures the civilians or the residents in this area have in trying to counter that.

COLONEL RATCLIFF: Maybe you could elaborate a little as to maybe what exactly you might have in mind as an example of the kind of thing that you think might occur that you would want that kind of recourse for.

MR. ANDERSON: I am not originally from Valentine. I am from the Pacific Northwest, near McChord Air Force Base. McChord Air Force Base, in conjunction with the Canadian Air Force and with the Air Force from the Armed Forces of Australia, began maneuvers similar to these over the Straits of Georgia, which are in between the state of Washington and British Columbia, and originally they were supposed to be contained--or originally they were intended to be contained in an area that had a circumference of approximately twenty miles. And as it turned out, it turned out to be over a hundred miles and the people in that area are at this time trying to make some kind of a statement to both governments and try to reconcile this situation to contain it back to the original proposed area where it happened.

COLONEL RATCLIFF: Let me ask you this, is this something that just occurred occasionally, or is it something that is just constant now?

MR. ANDERSON: It is something that started a year and a half ago and is on a fairly consistent basis. And it specifically affects the fishing industry and I don't know what correlation there is between fishing and cattle, but sonic booms and quite a bit of other type of military aircraft activity near the surface of the water dramatically affects the fishing industry in that area.

COLONEL RATCLIFF: So basically then, I think your question is, to get back to it is, as you posed it, is that if the Impact Statement is approved and there is some specific guidelines there as to what is contemplated, and then at some point later it looks like those guidelines are not being followed, what recourse then do the local people have, is that it?

MR. ANDERSON: Yes sir, will there be some kind of opportunity or committee or whatever, from the local vicinity here to have some direct input to the Air Force on this?

COLONEL RATCLIFF: I believe Mr. Thompson from Twelfth Air Force Headquarters Air Space Management would like to respond to that.

MR. THOMPSON: The aircraft that will operating in this area will be on an IFR clearance from the FAA. If they proceed below the altitude that they are cleared for, in this case, fifteen thousand feet, for a block of fifty-one thousand feet then they will pure and simply be in violation of FAA. By the same token, if they spill out of the boundaries of the airspace laterally, then they are in violation of the FAA. And the FAA is capable of detecting this because they have very good radar coverage. They watch the activities out there. Not to police us for what we're doing in the area but to make sure we stay in it because they're keeping other aircraft away from us.

COLONEL RATCLIFF: Mr. Thompson, perhaps you could go a little bit further, as to what the people here, for example, might do or should do in that situation.

MR. THOMPSON: Well, in that situation, if somebody is positive that they perceived a violation, they should go to the

FAA because the FAA is the one that will make a formal violation and they are they ones that will force the military to take the appropriate action against the aircrew that created the violation.

COLONEL RATCLIFF: Maybe someone else from our panel might want to--Colonel Stamm?

COLONEL STAMM: I would like to address that, if I might. One of our concerns, very primary concerns, is that we live here too and we're all in this thing together, very frankly, so it's in our best interest to be able to do these sorts of things, to be able to do the things that have to be done. So we protect the right to come up and fly in areas like this very carefully. If one of my pilots comes out and violates the rules that we have set up to operate in an area such as this one, he's dealt with very harshly. The first instance, normally it would be a grounding type of situation for a period of time. If that occurs again, much more serious measures will be taken against the pilot that doesn't understand the rules and doesn't live by them. We all live by the rules because we are flying machines that are extremely expensive to the taxpayers; they are extremely sophisticated, we don't have a lot of them and we have to protect them so that we don't go out and lose them, we have to protect the right to do that. Consequently, an individual that doesn't live



by those rules--it's that simple, and that's not to say that on instance we don't have people that violate it. That does happen on occasion and we do deal with it rather severely.

Another thing I think is significant too, very often low-level flying is confused with supersonic flying, and there is low-level routes that go through in this area. A low-level, high speed aircraft will generate a good deal of noise. It won't generate a boom but it will generate a good deal of noise and if you see the airplane that is making that much noise, probably you're not seeing one of us. From fifteen thousand feet, you're talking about an airplane that is two to three miles away from you and you're not going to be able to even tell what type of airplane it is unless you should happen to see the sun reflect off of it or you just can't see it. If we have people that are flying below fifteen thousand feet, we're going to have a problem like we just talked about, they aren't following the rules that are set up. If we're out dogfighting at thousand feet or so, you are not going to very easily see that airplane or it it's a supersonic F-15 (indiscernible).

I think one other thing I would like to mention to you in the way of clarification, the sorties that we're talking about flying down here are actually, if I might use the term, are spill over sorties and what we cannot fly at White Sands Missile Range. White Sands Missile Range is right now excellent airspace. It is very close to Holloman, supersonic, we would prefer to fly all of

our sorties there. What Major Graham was trying to relate to you is that we can not because our priority is not very high on that range. We will use that as our number one place to go every time possible. In many instances it is impossible so we have to have other places to go to train, and that's the reason we're looking for other airspaces, such as Valentine and Reserve to train in.

COLONEL RATCLIFF: Thank you. And I might indicate a response, of course, further and I think Colonel Stamm certainly, if he didn't indicate it specifically, I think you may have gathered that, but one of the places that you might very well start is there at Holloman Air Force Base from whence the aircraft are flying. And I would suggest that to be the very first place to seek corrective action.

I would ask for our own people, when you speak, again, let me ask if you would use the podium. And one of the reasons, not to complain too much, but the court-reporter, with your backs turned to her, it makes it difficult for her to pick up what you are saying.

Alright, let's see if there are yet other questions.

Let's see, we have a gentlemen behind you, or a lady behind you there, who wanted to ask a question before you, Mr. Voigt.

MS HOY: I am Roberta Hoy from Post Office 355, Fort Davis.

COLONEL RATCLIFF: How do you spell your last name?

MS HOY: H-O-Y.

COLONEL RATCLIFF: I thought that might be, but I wanted to make sure I was understanding you correctly.

MS HOY: No relation to Bob Hoy in El Paso.

This all deals with pages 9-3 and 9-4 in the Draft EIS. It's all on the water well section, about impacts on water wells. I have actually several questions.

COLONEL RATCLIFF: Let's take them one at a time, unless they are all interrelated in some way.

MS HOY: First of all, it deals with numbers which aren't included in the EIS. They are included in relative terms now, but there are no actual values given.

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First of all, in the last paragraph on page 9-3, they use the figures of 5 psf and 0.05 for carpet booms resulting in 10% of the Dade County blasting code in terms of ground motion.

And on the previous page, on page 9-2, in about the middle of the page, they use a focus boom worst case with 20 to 26 psf, but they never say what percent of the Dade County blasting codes in relation to ground motion that would be.

222 COLONEL RATCLIFF: Alright, her question then has to do with why th s was omitted on page 9-2, is that your question? 222

MS HOY: On page 9-3 they use a carpet boom case of 5 psf, which is not really the worst case condition, which they described on the previous page. And so I wondered what percentage of the Dade County blasting code would be involved for ground motion if they used the worst case condition.

COLONEL RATCLIFF: Alright, to be very frank with you, I certainly don't know the answer to that. I don't know if we have anybody here that does but let me see right off hand, is there anyone who is knowledgeable in this particular area?

I don't think we have, however, again, your question has been made a matter of record and hopefully it will get some attention.

223 MS HOY: And in relation to the Dade County blasting code they never give a figure for it, they just say 10% of it. They never say how much 10% is, and it would be helpful, I think, for future reference if they gave the number. Because you usually can't find the Dade County blasting codes very easily. 223

COLONEL RATCLIFF: Now, let me indicate, I think you've been very helpful by suggesting something that might be additionally added and I would ask that you, as well as others, where you run across something like that and you want to make that kind of a recommendation, even though we're right here dealing with your questions, it helps to propose it in the manner that you have.

All right may we have your next one, please.

224 MS HOY: Also, in the middle of page 9-3, they have the "seismic activity as exhibited by maximum velocity", and there are two questions. One is, the maximum velocity of what? And the other is, what is the maximum velocity? Again, if they have a number or a higher range of numbers; a higher range, if they don't want to give a maximum number. 224

COLONEL RATCLIFF: Alright, do we have anyone who is in a position to address this particular issue?

Alright, apparently we do not again. Likewise, it is a matter of record now, the issue that you have raised.

MS HOY: Further on in the discussion, the seismic effects on the water wells.

COLONEL RATCLIFF: Whereabouts are you now looking, do you have a page and paragraph?

MS HOY: No, I don't have a page and paragraph. It's the bottom of 9-3 and into 9-4. And there is, when they are talking about the ground motion, they never say anything, they're talking about wave attentuations, the seismic waves, they never say anything about rock type, what they are in, or the sedimentary formations. And, I believe, the state of North Dakota has done a great deal of work on this. I notice all the references are Air Force references. There are some other people doing research on this which might be helpful in answering some of these questions.

And the last one is, where can these references be obtained. If we wanted to look at some of these Air Force papers like the--I believe there is one Goforth and McDonald which is referenced.

COLONEL RATCLIFF: That one possibly, someone might be able to give us the answer. The material that is used in writing this, that is the reference material that has been drawn on, if they want to obtain that information, that is as to what the reference material is, who do they contact?

MR. CHAVIS: The Goforth study is a NASA publication that is available through the National Technical Information System out of Rockville, Maryland.

MS HOY: Is there any place in El Paso, is there a local library up there anywhere that would have these?

MR. CHAVIS: That, ma'am, I have no knowledge of.

MS HOY: Thank you.

COLONEL RATCLIFF: Thank you very kindly.

COLONEL RATCLIFF: I recognize that some of these might have gotten more in the area of statements, but there are still several questions. I'm sorry we were not able to provide an immediate answer to the question.

Alright, do we have--if you would like to speak again?

RICHARD CINOTTO: Back to the original--my name is Rick Cinotto, Richard Cinotto, Box 277, Valentine. Back in the original briefing, Major Graham, went over all the alternatives they had for airspace, the conclusion, or whatever. It appeared that they were saying the airspace around Holloman was too crowded for them to fly all the missions they needed to fly, so they're looking at Valentine and other places. My question was, in the alternatives that they considered to the crowded airspace system at Holloman, was one of the alternatives ever considered - moving Holloman Air Force Base? My question is, we're here to do an Environmental Impact Statement to see if my town meets the qualifications of the Air Force. My question is, if the Air Force right now did an Environmental Impact Statement on their own Air Force Base where it is, does it fit the needs of the Air Force.

The Colonel stood up and said "we're all in this together". Well, he lives two hundred and twenty-five miles from



where the booms are going to be, I question how much together we're really in this.

My question is, as an alternative, my question sir, as an alternative, was the moving of Holloman Air Force Base ever considered to resolve the problem?

COLONEL RATCLIFF: I think I could say no, although I have no idea beyond just guessing, but I would ask if anybody knows whether it was ever considered.

It was not. Colonel Stamm is indicating no, that was not considered.

MR. CINOTTO: Well, is there any way an Environmental Impact Statement could be done on Holloman now to find out whether or not it does meet the needs. They have a fighter wing there that we've heard from the briefing, they can't fly all their sorties in. It would seem to me that they're living in the wrong place then.

COLONEL RATCLIFF: I appreciate your questions. I think you're getting more into the nature of a statement, as far as a recommendation at a later point.

MR. CINOTTO: Alright.

COLONEL PATCLIFF: Colonel Stamm would like to address that.

COLONEL STAMM: The reality is that there are air spaces currently all over the U.S., as a matter of fact, Holloman is one of the better places, to have an operation such as the one that exists there right now. Even the water ranges on the borders of all the U.S. are very high use items and the range States for this type of training is extremely limited.

There is subsonic airspace available. What we need is supersonic airspace, much as Major Graham pointed out, we need to be able to train supersonic to be able to employ the weapon system to its fullest capability.

If I can just go off on a tangent for just a second, if I might. The reason we're interested in doing this, is because we have to train on the systems in the way we want to fight them. We didn't prepare for War I that way and we didn't do at the onset extremely well. When we went into War II I can still remember seeing documentaries of people practicing with wooden guns before

they went to battle. In other words, they were not able to train with the equipment before they were thrown into battle. It cost many lives to do that. When we went to Korea, we had many people that were fresh out of World War II, aviators at least, that did extremely well and scored a very high kill ratio, which I believe was something better than seven to one. When we went to Southeast Asia once again, the war that many of us are familiar with, we were not allowed to train in a proper fashion. We were not allowed to go out and dogfight with the machines the way we should have been able to. Consequently, the results that we had in Southeast Asia are not nearly what they should have been with the weapons that we were flying. And that's the reason for this approach. We need supersonic airspace to be able to train to the fullest capability the machines that we are able to deploy as the case may need deployment. So if a contingency should break out, we don't lose lives and time trying to get up to speed in a weapons system.

COLONEL RATCLIFF: Thank you very kindly.

Mr. Voigt, I must apologize. I meant for you to have been next and then it slipped my mind when I saw the other hand go up.

MR. VOIGT: That's alright.

My name is Ralph Voigt. I live on Highway 166. My postal address is Fort Davis although I'm a good many miles outside of it.

I had prepared a question here for Major Gauntt or Thomas Lord hoping either of those could be present because of something that had come up at one of our earlier meetings and one of the answers we got to the question was from both Captain Gauntt and from Thomas Lord.

It relates to the fear we have of damage to the adobe structures in which this area abounds. None of them made to FHA standards, of course, and as a consequence they are all at risk; principally at risk because of the ratio pointed out in the DEIS that the Air Force pays for replace of old-old structures.

The thing that is intended to assuage our concern about this is a statement on page 3-22 in which it says "One additional investigation is worthy of mention. The 1977 an adobe house in southern Arizona was instrumented and evaluated while supersonic training was taking place overhead. The conclusion of the evaluation was that the adobe structure reacted similar to a convention style structure." This is mentioned not only in the original DEIS but also in this one two or three times. At the

time the meeting was concerned with the original DEIS, Mr. Lord and Mr. Gauntt spoke to this and said they had spent about a hundred thousand--or the Air Force had spent about a hundred thousand dollars on this test. Now, in order to lead to my question, I would like your permission to quote from the hearing that was held in the Sells MOA in which Captain Gauntt made a statement and Lieutenant Colonel Johnson also made a statement and were both present at that test. May I proceed with that quotation?

COLONEL RATCLIFF: I assume that it's not a lengthy one, is it?

MR. VOIGT: No, but it leads directly into the question.

COLONEL RATCLIFF: Alright, proceed then please.

MR. VOIGT: Which relates to this statement in the current DEIS.

Captain Gauntt said at the Sells MOA meeting in 1978, I believe it was, or "9", I don't recall.

COLONEL RATCLIFF: Do you have a cite number, page number, or something?

MR. VOIGT: I have the transcript of the meeting with me, yes. Page L-37 and L-38.

Captain Gauntt said "I was responsible for that team coming out here last December. We were very disappointed with the results. The fact is, we got only one good sonic boom that we recorded, a substantial sonic boom. We did hear two or three other minor ones but they were not of sufficient overpressures for us to get any good readings on." Lieutenant Colonel Johnson then said "Unfortunately, with just one sonic boom you really can't make the positive statement. It appears that the adobe structure is not supersensitive from we have seen from that one exposure."

On June--August 6 and 7, 1980, there were present the Physicist, Dr. Bill Galloway, from Bolt Beranek and Newman, who was to prepare and was given a contract for forty thousand five hundred and nine dollars to prepare a critique of that first DEIS in which this question was raised about the Arizona house. This DEIS has exactly that same statement, that the test was conducted and it shows that sonic booms, plural, will have no effect upon an adobe structure.

COLONEL RATCLIFF: And your question then is?

226 MR. VOIGT: My question is, why did not Major Gauntt, who was present with Dr. Galloway, Mr. Tom Lord, your Environmental man at the time, and Mr. Al Chavis not point out to Dr. Galloway that only one sonic boom was the basis of this entire test? Why is it again repeated at least twice in this DEIS as being a standard, as being a criteria? This is my question. Unfortunately, neither Major Gauntt, who was involved in that, and Lieutenant Colonel Johnson, are not here to answer this question. Perhaps someone else can. 226

COLONEL RATCLIFF: We will see. That sounds like one of those questions that we're not likely to have anybody that would be knowledgeable to that.

MR. VOIGT: Well, we have an environmental man here, can he tell us why one boom would be set up as a standard?

COLONEL RATCLIFF: Just a minute and we will see whether there is an answer to that.

MR. VOIGHT: Alright.

COLONEL RATCLIFF: Captain Flanagan, are you aware. Do you have an answer to that?

CAPTAIN FLANAGAN: No sir, I just wanted to indicate time.

COLONEL RATCLIFF: Does anyone, Mr. Chavis are you acquainted with that all?

MR. CHAVIS: Mr. Voigt, I can't answer your questions but I certainly know the two individuals that you mentioned, Major Gauntt, and that will be posed to him as soon as we get back and the answer will be in the Final Impact Statement.

MR. VOIGT: Thank you very much.

COLONEL RATCLIFF: Thank you, Mr. Voight.

We have a hand up back here. If you would please.

VOICE FROM THE AUDIENCE: Could the military people please give their names when they come to the podium so we'll know who they are?

COLONEL RATCLIFF: Alright, now I have called them by name as they have come up. And I did just then to Mr. Chavis.



VOICE FROM THE AUDIENCE: We can't hear your.

COLONEL RATCLIFF: You can't. Can you hear me alright now. I appreciate it by your indicating, of course, that you can't hear because we definitely do intend that you be able to hear and that you know just who the speakers are.

We have a hand up here. Yes, ma'am.

MS MILLER: I am Jo Ellen Miller, Box 279, Valentine. Will all of the trainees in this area be American citizens?

COLONEL STAMM: Yes, they will.

COLONEL RATCLIFF: Colonel Stamm is shaking his head yes and indicating that, yes, they will all be American citizens.

MS MILLER: Well this--you're going to tell me I'm making this statement, but a former U.S. Congressman who served on the Armed Services Committee told me a couple of three years ago that most certainly foreign troops would be trained here.

COLONEL RATCLIFF: I'm sorry, I doubt very seriously if there is any one of us that could respond with regard to the congressman. Colonel Stamm?

Does everybody understand that Colonel Stamm is responding?

COLONEL STAMM: I think there is some confusion in that there are two wings at Holloman. There is the 49th Wing which flies the F-15s which is the center of this discussion. There's also the 479th Wing which is a training wing and they fly T-38s.

As Major Graham indicated, they don't have enough range to get down to this area so they train in areas very close to Holloman. But yes, there are foreign students that go through the 479th Training Wing.

MS MILLER: They are there?

COLONEL STAMM: Yes, they are there but they do not fly F-15s. The 49th is a Tactical Fighter Wing. It's a United States Air Force unit and we have no foreign nationals in it. We are of the unit that trains to go to combat at a moment's notice as Major Graham indicated. But also, at Holloman there is another wing, training wing, that flies T-38s, a small airplane with a much shorter range and that wing does in fact have foreign students come through but they would never be down in this area.

MS MILLER: They wouldn't be here?

COLONEL STAMM: No, ma'am.

MS MILLER: Thank you.

COLONEL RATCLIFF: I might indicate Colonel Stamm, as we introduced previously, he is the Deputy Commander for Operations for the 49th Tactical Fighter Wing.

Alright, other questions?

MR. WORTHINGTON: My name is Richard Worthington. My address, 740 Tempic, El Paso, Texas.

There are now very powerful arguments in regards to what is recorded on the tympanum of the ear and interpreted in the brain may have potent health effects. In that regard, I pose the following question: Why have you failed in your EIS to consider the human perception of double sonic booms, as the peak over pressure and peak lower pressures pass the ear? Why have you failed to consider the effects of these booms and address this issue?

COLONEL RATCLIFF: Is there anyone here who is in a position to respond to that question?

Apparently not.

It will be on the record and I would therefore expect that it would be addressed.

MR. HALL: My name is Dave Hall. I am living at the Trude (phonetically spelled) Ranch at this time at Fort Davis, Texas.

I have lived in many urban areas, you may hear a little accent and distinctly related and close to civilian airports, La Guardia's Stack Pattern, the landing pattern at O'Hare, and what I would like to know is, will the Air Force be providing instrumentation to the civilian population to verify the actual and observation for the behavior of the aircraft? In other words, sitting in a home while your glasses wobble off the table and then looking to call somebody and saying this happened in my house last night, because it happened at six o'clock and there's no one there to answer a phone until the next morning, this is very hard to verify. So will the Air Force be providing instrumentation so that the civilian population can feel security in that these areas will be adhered to, not only in terms of physical movement but in terms of sound decibel level, and things like that.

COLONEL RATCLIFF: I'm not so sure that I follow you completely. You're asking if this information is going to be supplied, that certain information will be supplied by the Air Force to the public?

MR. HALL: Will the instrumentation be available to the public in this area so that if a plane overflies it can be verified? For a person to look, on the ground, and say well I think that plane is no longer within the airspace, is not rather something that you can back up and also, if it exceeds a livable decibel level, it's not something that--this gentlemen talked about, it's affect on the ear, without appropriate instrumentation, how can you prove it?

COLONEL RATCLIFF: Alright, let's see if there is anyone who will be able to address just exactly what type of information--I can, of course, again, imagine certain information that would automatically be available as to the instrumentation with regard to some of this that you're asking for. I certainly wouldn't be sure, but let's see if we don't have some member who is here that could address that. Colonel Stamm?

COLONEL STAMM: I can talk to it, I can not address this specifically or exactly. As far as instrumentation being provided, no I don't believe that would be feasible. We do, as was mentioned earlier, watch the boundaries of the area on radar to make sure that the aircraft stay within the boundaries. We have a recording mechanism for sonic booms at Holloman that is a fairly active mechanism. If an individual in the northern areas for instance, experiences a sonic boom in the northern areas of WSMR, in an appropriate situation, they have a reporting channel at Holloman that they can call, an area within the Command Post or into the Public Affairs System. The sonic boom complaint is investigated on every instance. We try and determine who the aircraft was and what he was doing there and run a total investigation on every sonic boom complaint, which as a matter of fact would be going on here right now if there were sonic boom complaints.

The sonic boom that we are talking about, I think, is not as prevalent as may be perceived from the report. I will address this primarily to--for example, what we did last week. We were concerned about a test that was going on in the northern airspace at WSMR and they wanted to restrict our flying around it because they were concerned about the effects of sonic booms on these tests.

I took one of the--I had one of the people go out on the ground with the radio, at the site, and I flew past the site on numerous occasions in an F-15 at low altitude running from five to seven thousand feet above the ground at supersonic, we past it at five miles at ten thousand feet and all they heard was a rumble. They did not hear a boom. I had to get as close as two and a half miles at five thousand feet before they got a boom. Now that's an extreme case, I realize, because there are other instances where just turning the nose through a situation can cause a boom.

But if I can also try to put this all in perspective, the thing that Major Graham mentioned earlier, the most that we would probably use this airspace would be from twelve to sixteen airplanes per day and those are four-ship elements, so we're talking about three or four periods per day and they're going to be in this airspace for approximately twenty minutes. So for three or four periods a day for a twenty minute period of time, there is a possibility that these aircraft, in their maneuvering, might in fact go supersonic and might in fact have a boom that would either have a footprint that went across the location which you were at, or in fact might be swung through the location and you might hear it. But very often, if it has altitude enough, it may not even reach the ground, that's another reality. Much as I

was trying to relate that test that we run last week, every time you go supersonic, it doesn't necessarily mean that someone is going to hear it. If you happen to be exact point of that footprint, you will hear it.

And by the way, back to an earlier question, yes we do get boomed at Holloman, and we're doing okay.

COLONEL RATCLIFF: In regard to the question that was just posed, would I understand that as far as instrumentation of the nature in which the gentlemen was questioning, that there isn't any instrumentation that anybody would be able to look at and thus be able to pinpoint exactly where the aircraft was and which one may have been responsible and that sort of thing. But through an investigation if one became necessary, you could probably pinpoint just exactly when, where and who was responsible for it.

Any further questions?

I think I saw a hand up here first.

MR. MILLER: My name is Clem Miller, Box 279, Valentine.



There has been reference to the rules of operation both in the briefing and I believe Colonel Stamm mentioned them also. Are these rules permanent, or are they, once the area has become operational, are they subject to change without a complete new Environmental Impact Statement.

COLONEL RATCLIFF: Alright, do we have someone that can address that?

This is Mr. Thompson who is from Headquarters Twelfth Air Force, he is with the Airspace Management Office.

MR. THOMPSON: I can give you an example, Mr. Miller. We have about six or seven areas in the United States over land where we presently conduct supersonic flights below thirty thousand feet and none of the rules that were put in when these areas were established, and some of them have been established for quite a number of years, have changed.

If they were to change, then yes, we would have to do either a new Environmental Impact Statement or an addendum to the Environmental Impact Statement to comply with the laws.

MR. MILLER: Thank you.

COLONEL RATCLIFF: And I think we then had a question over here.

MR. ALBERT MILLER: My name is Albert Miller, Box 67, Valentine. On page D-18 of the Environmental Impact Statement, there is discussed a lack of reaction by Swedish Reindeer to Sonic Booms, even though it does admit they did not adapt to startling sounds. I want to ask someone why the rest of the report was not commented on. The report goes on to say that first, the Laps do not corral their animals for slaughter, marking, or other purposes during thunder storms or sonic boom periods because of panic stampedes. Second, the report goes on to say that the test was made during the animal's quiet time, no gestation, no calving and no feeding. It said, this means that it does not eliminate the possibility that booms could have negative influences on their reproduction. This part of the report was not included in the EIS and I wanted to know why.

COLONEL RATCLIFF: Alright, does anyone here know why this part of the report was not included? It may be that it was strictly an oversight, but--.

MR. ALBERT MILLER: If I may, I wish to ask an additional question in that what relevance does effect on Swedish Reindeer have on our species in the Valentine Area?

COLONEL RATCLIFF: This is Mr. Chavis who is from the Headquarters TAC Environmental Planning Division.

MR. CHAVIS: Sir, I think you may have just answered your own question. It is not relevant. You have no Swedish Reindeer in Valentine, Texas.

228 MR. ALBERT MILLER: Thank you. Again, another question, why were not reports on the effect of sonic booms on species such as mule deer, specific reports, detailed studies, done on mule deer, prong-horned antelope, and domestic cows, there are general comments on these three in the report. There are no specific studies. 229

COLONEL RATCLIFF: Does anyone know why these were not addressed in the study?

Again, Mr. Chavis.

MR. CHAVIS: That question will be answered in the Final for you, sir.

MR. ALBERT MILLER: Thank you.

COLONEL RATCLIFF: We have a question back here at the very rear of the auditorium.

MS FLIPPEN: My name is Corinna Flippen, Box 224, Valentine.

We have determined you can save money and training time by moving the supersonic activity to Tyndall Air Force Base in Florida. We found the economic impact of your being here is far greater than you have shown.

COLONEL RATCLIFF: Excuse me, are you going to be asking a question?

MS FLIPPEN: Yes sir, after I have stated this statement. This will be presented to you in the form of a thirty-one point critique.

COLONEL RATCLIFF: Well no, you're not going to make a thirty-one point critique right now.

MS FLIPPEN: Well no, with these statements, you will ask me how do you know, that's why I'm telling you this.

COLONEL RATCLIFF: No, I'm going to let you ask your question and I'm not going to necessarily ask you how you know but I just didn't want to end up getting into what is in effect a statement that you are going to make and that's to be reserved at a later time. If you have a question you want to pose and possibly one that can be answered because it sounds like you're going into something that somebody has made their own study or observation, which is of course perfectly alright if you've done so. You can pose the question then.

MS FLIPPEN: In reference to all these studies that were made proving that there are dangers to health and whatnot, more than 97% percent of us petitioned you to stay away and, which we were told in one of the first meetings that if enough of us got together we could keep you away. Enough of us have gotten together and haven't been able to keep you away. So, my question is, what further things do we have to bring up to you to stop sonic booms.

COLONEL RATCLIFF: Well, I'm going to make an initial comment and then certainly we will see if other members may have a comment they want to make.

Part of this, of course, and I think perhaps the more pertinent part, is the fact that this proceeding is for the purpose of getting the input from people such as yourself who have comment and questions so as to then put this into the appropriate package so that this information can be evaluated and the decision made.

As I have indicated at the very beginning, I am not in any way a part of the decision-making process and as has already been indicated, the level at which the report with all the facts will ultimately go is certainly above the level of all of us who are here. So, when it comes to, you're saying what information do you have to put in, I don't believe that there is any certain fact that one could point to and say well, if you did this, then it would all go away. It's a matter of gathering all the information and you are a part of it with your input and then it is all evaluated and the decision made.

So, I recognize I'm not really giving you the kind of answer that maybe you're looking for but I don't think there is any way that I can give you the answers that you wish. Maybe there is someone else that would like to address this.

Apparently not.

MS FLIPPEN: Okay, thank you.

COLONEL RATCLIFF: I believe that there may have been another question over here at the same time. Alright, the gentleman back here then; and then, Mr. Voigt, I believe you would have been next.

CLYDE ANDERSON: My name again is Clyde Anderson. My address is General Delivery, Valentine, Texas.

Number one, I would like to state that I am the first grade teacher in the elementary school here. I have two questions, maybe more, but right now two.

Specifically, number one is, is this footprint that the sonic boom creates going to step on my first grade classroom? And the second question is, how many times am I going to get stepped on during my presentation between eight o'clock in the morning and quarter to four in the afternoon?

COLONEL RATCLIFF: Now, what do you mean exactly by "being stepped on"? Do you mean just the fact that you--

MR ANDERSON: I mean having to stop my presentation while I get things under control after a sonic boom. If the noise that the principal makes in the hall by going like this (clapped his hands together) stops my class for three minutes, because somebody might have been acting inappropriately, how much more am I going to have to deal with as far as maintaining control in my classroom from the boom, or the footprint, or whatever this is, how much affect is that going to have on me? Can somebody here tell me, do I have to stop my class ten times a day, fifteen times a day, twenty times a day, it's important to me to have that information.

COLONEL RATCLIFF: Major Graham?

MAJOR GRAHAM: I can't answer the specific question, the number of times. We put a five mile buffer around Valentine in order to reduce the sonic booms to the town.

MR ANDERSON: Well, how far does this sonic footprint go? I mean, if it's five miles, can the plane break the supersonic barrier in Van Horn and can the footprint hit Valentine, or can it--



MAJOR GRAHAM: Your specific question, no.

MR ANDERSON: Then, still, I would like to have some kind of a reasonable answer to my question. How many times a day if--I'm not sure but I've heard kind of through the grapevine this has been going on, this process, for about four or five years and I would kind of like to know how many times a day are the instructors and the people in Valentine going to have to deal with the sonic boom, or is it something we will have to wait for?

COLONEL RATCLIFF: Mr. Chavis, from the Headquarters TAC Environmental Planning Division.

MR CHAVIS: As Major Graham has indicated to you there is a five-mile buffer zone around the town of Valentine. In addition to that, from the statistical analysis that has been conducted for the impact statement, we found that the average lateral spread of the sonic boom is about five nautical miles and those in fact, the footprints that were shown on the last briefing slide of Major Graham's briefing, showed you those footprints. They are in fact outside the five-mile no-flight, no-supersonic boom boundary for the town of Valentine.

If there were not restrictions for that, no supersonic restrictions for the town of Valentine, then I would say a maximum two to three booms per day, based on statistical analysis of what we believe is going happen in the center of the ellipse all the way out to the edge of the ellipse, no more than two or three booms per day.

MR ANDERSON: Then in regards to that, may I pose one last question. Can I be guaranteed that I will not have to deal with no more than three booms per day? I don't want four, if it goes into effect, I don't want four or ten or twenty, I just want three, if that's what I'm going to be allotted at this meeting, or whenever this goes into effect. I don't want any more than my share.

COLONEL RATCLIFF: Alright, I'll be very honest with you, and I can't speak for the group, but I doubt if there is anybody that would make that guarantee, is there is anyone that is here that feels that there is any type of a guarantee than can be made?

MR CHAVIS: I think that on close examination of what is said in the impact statement there is a figure, or table, in Chapter 3 that discusses the range of probabilities of hearing a given number of booms. And the probability of hearing more than three booms a day here in Valentine would be awfully, awfully, minimal.

I, nor no one else who will play the statistical game will offer any such guarantee as to a set number of booms. All that we can tell you is that, based on what we know, and from a worst-case analysis, what we believe will happen. That sir, I submit, is as far as anyone is able to do at this point in time.

COLONEL RATCLIFF: Colonel Stamm also indicated that he would like to address that question.

COLONEL STAMM: If I might, by further description of what the situation actually is, there are other things that affect the use of this airspace significantly. A good example is that just recently we deployed one squadron to Germany, so we only had two squadrons remaining at Holloman. Consequently, the level of activity at Holloman and the requirements for airspace go down. There probably would have been a lower requirement for the entire month that that squadron was deployed. So for that entire month you may not have heard one boom, or if we did send some few airplanes down here and they just didn't happen to accidentally boom over valentine, you probably would not have heard a thing that entire month unless some stranger came booming through here from some other base, and I can't control them. That's inappropriate to the discussion.

The reality is so that we deploy units all the time. The reality is also that very often we have adequate WSMR airspace to accommodate what we're dealing with. For instance, we don't spend all of our time out flying ACBT, which is the dogfighter that we're talking about. We spend a good bit of time deployed to the places such as Tyndall to fire missiles with the units down there. We spend other time firing after dark, which takes place at WSMR. We go to other bases and fight with the units of the other bases so we have people deployed continuously so our requirement for airspace on a one hundred percent basis does not actually indicate that we would be down here every day, as a matter of fact, or very often there would be periods that we would not be requiring your airspace. And those periods that we did have a full-up contention at Holloman and did in fact have to come down here and fly in your airspace, and did in fact go supersonic, the odds that it would happen directly over Valentine, or the odds that the footprint would be at a low enough altitude to give you a significant boom, on those instances you might find some disruption in you classrooms. But to say three times a day, that would be an exaggeration because I don't think it would happen that often. In the periods when we are using the airspace heavily, I would think that that might be an adequate number.

Does that answer your question?

MR ANDERSON: Yes sir, thank you.

COLONEL RATCLIFF: Mr. Voigt, I believe that you were next with a question.

MR VOIGT: This question--Voigt again, this question relates to the CDNL, that is the C-weighted Day Night Level. Is there anyone here that is familiar with the D Section of the DEIS in which this is addressed?

COLONEL RATCLIFF: Well, I think it would be still appropriate to pose the question because even if you don't get an answer here, you will be on the record and as was indicated, it would be anticipated that these questions that never the less are a matter of record would be addressed.

229 MR VOIGT: Fine, thank you. I was afraid there wouldn't be so I went directly to the man who prepared that section, the D Section, again, Dr. William Galloway, of Bolt Beranek and Newman, and since you will bombard us only during the daylight hours he told me it would be appropriate for us to consider this C-weighted Day Night level on a twelve hours basis, instead of twenty-four. 229 This has the result of increasing the proposed average, decibel reading from 63.9, three points higher, 66.9. And by adding in

the factor of five days a week instead of seven, adds another decibel and a half to that, which it brings it then to 68.4, which is 3.4 decibels over the HUD and EPA acceptable levels for residential living.

Now, decibels are somewhat of a mystery to most people so if I may I would like to point out very briefly some examples of it.

COLONEL RATCLIFF: Alright, let me ask you here, do you have a question that your going to pose?

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MR. VOIGT: Yes. One decibel is a base. Two decibels are not twice as loud, but ten times as loud. Three decibels are not three times as loud as one, but a hundred times as loud as one. Which means that 68.4 decibels are fifteen thousand times louder than 63.9.

My question is, why was not this study conducted on a twelve hour basis so that we would get this final average of 68.9 instead of the--again, the pacifying average of 63.9, which made it acceptable HUD. Why was it not figured on the twelve hour basis so we would know that it was over HUD's level.

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COLONEL RATCLIFF: Alright.

229 MR VOIGT: Because of this point, the--you jab a man with a pin one second per hour it hurts. But if we average it over the thirty-five hundred ninety-nine seconds, it doesn't mean much, it pain much. And that's exactly what this CDNL shows by averaging a hundred fourteen decibel boom and saying it will only happen so many seconds during the day, why do we come up then with an acceptable HUD figure, which it is not when properly calculated. 229

COLONEL RATCLIFF: Okay, let's go back to the question you posed. Does anyone have an answer?

Apparently we do not have anyone who can provide an answer but as I've indicated, it has been made a matter of record and we would anticipate that it would be addressed.

230 MR VOIGT: Alright, now my second question is this, the same D Section shows that all these figures, all these determinations, are based on the experiences of the Oceana transcripts. But the Oceana transcripts are based upon only twenty-one flights. These twenty-one flights are used as the basis for the equations that are supposed to equal forty-five thousand sonic booms in a five year period here. My question is 230

this, how can such a thin base of only twenty-one flights, seven missions, be used as a base for the forty-five thousand booms we are going to get. Is there a statistician in the house that can give me the answer saying whether or not twenty-one is a viable base for this magnification?

COLONEL RATCLIFF: Any response to that question?

Apparently we do not have anyone who can address that question.

MR VOIGT: Alright then, we will have to wait for the EIS to get the answers, thank you.

COLONEL RATCLIFF: Thank you.

I think we have--we getting, if you've already asked several I will come back to you but let me get the gentleman back here who has not asked a question, I don't believe, so far. And I think we're getting pretty close to the point, unless I see something that suggests otherwise, where we're going to draw the question and answer session to a close here in the very near future and we will then consider the statement. I do want to give everyone that wants to make a statement--however, like I said, we're getting close to an end on that point.



MR ELDRIDGE: My name is Howard Eldrige. I live at Box 129, Valentine, Texas.

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To begin with, my family has lived here most of my life, all of my life, and all of my grandmother's life. The question I have is, what studies have been done on the effect of sonic booms on people with heart conditions, people of our senior citizen, and the younger children, as well as the wildlife, because some of our local ranchers have spoken out on that?

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COLONEL RATCLIFF: Alright, is there anyone that is familiar with what consideration has been given to this?

Alright, we do not have anyone that is prepared to address that.

MR ELDRIDGE: I have another question.

COLONEL RATCLIFF: Alright, proceed.

MR ELDRIDGE: Now it is already obvious since the other questions have answered most of mine, that a lot of things have been neglected in your all's Environmental Impact Study. This is a ranching community. These people depend, their whole livelihood depends on whether they get the rainfall they need each year, whether their calf crop comes in, whether they can break enough

horses to sell them each year, what kind of study are you all going to find that will tell you how to deal with the person that does not live in the area.

We understand your briefing, what we need to do is to brief you on the problems these people have to go through every year to make it. And I'm not talking about making big bucks, I'm talking getting by.

Can you, if you can, please put it in the record, this type of study should indicate exactly what this type of activity is going to have on these people's operations each year, each day, each month, each day of the year, instead of just - well, we're just going to take it and we'll use this airspace.

The five mile area around Valentine is fine. A lot of these people don't live in Valentine. They live five miles out there, against the mountains, they're going to be receiving most of these. Those are the people that you have to worry about.

COLONEL RATCLIFF: Alright, is your question then what study has been made?

MR ELDRIGE: No sir, I'm asking, will there be a study made? It would be preferable, yes sir. I think it's appropriate.

COLONEL RATCLIFF: Alright, is there anyone who is aware of whether such a study will be made?

MR ELDRIGE: Thank you.

COLONEL RATCLIFF: Thank you very kindly, apparently there is not a response at this time to that question.

MR CINOTTO: My name is Richard Cinotto of Box 277, Valentine. Something the Colonel mentioned before about if there's too many sonic booms it might be somebody else coming in or whatever.

My question is, is this sonic boom area only for the people at Holloman Air Force Base or will all Air Force Bases be using this thing, or other military arms, not just Air Force? Will the Navy be using this, or some other Air Force Base be flying people here to use it, or just Holloman?

COLONEL RATCLIFF: Okay, can anyone address this question?

Major Graham?

MAJOR GRAHAM: At the present, the 49th Wing at Holloman schedules the area and it is the only airspace user. In the future we do not see any other activity, other than the 49th Tactical Fighter Wing.

MR CINOTTO: Okay, just one more question along the same line. Are there any other wings that are projected or planned to move to Holloman within the foreseeable future that's in planning, as far as training wings, or fighter wings moving to Holloman, additional aircraft activity?

MAJOR GRAHAM: No, not at this time.

COLONEL RATCLIFF: Are there any further questions at this time?

MR WALTER MILLER: My name is Walter Miller, Box 279, Valentine, Texas.

My question deals with, it has been stated that the final decision has not been made on this and the decision maker is a civilian in the Secretary of the Air Force's Office. How can we be assured that the points we are making here are read by him instead of by his staff or whatever, and if they act as a buffer zone between what was actually done here and what reaches him. Also, I'm just wondering, this civilian in the Secretary of the Air Force's Office, could we know who he is, or does anybody know that?

COLONEL RATCLIFF: Alright, the question has been posed, and as I have indicated I am not a part of the process of which this goes through at all but possibly some of the gentlemen who are here can address that.

This is Major Poli who is from the Headquarters TAC Environmental Planning Division.

MAJOR POLI: We are complying with the NEPA process and the environmental law. We can't be assured that anybody in the Secretary of the Air Force's Office will read what he signs but in most cases, he didn't get that far without reading what he signs. In most cases he will have his staff go through it and he will also read it, and I'm sure if he puts his name on it that he is familiar with the document, with the decision.

COLONEL RATCLIFF: I have a question from the gentlemen in the very rear.

233 | MR VERDIN BALDWIN: My name is Verdin Baldwin, Box 241, Valentine, Texas. My only question is, I have lived here all my life and you get out on these mountain areas right hear and you can hear a double echo. You go to a mountain across the canyon and you holler and it will come back to you as loud as you said it | 233

or louder. What is this going to do when a boom is five miles away or ten miles away? What is it going to do here? We've got two mountain ranges. Is it going to be louder or softer?

COLONEL RATCLIFF: Is there anyone who is that familiar with the sonic booms, that can respond to that question?

Apparently no one is that knowledgeable that is here, but again, it has been made a matter of record and we would expect for it to become a part of the final product.

MR VERDIN BALDWIN: It just was brought up when he said that when they were flying he had to get within two miles, okay, was this level ground that he was testing on, or was it a valley like here?

COLONEL RATCLIFF: Alright, Colonel Stamm will address that question.

COLONEL STAMM: That was out at White Sands Missile Range and it was up against a range of mountains. It was a site right near the Trinity Site as a matter of fact, where the first nuclear weapon was detonated and there was a test site right next to it. There is a bank of mountains right to the east of that about five

to seven miles. The reason no one can answer your first question is because even at this location with the two ranges of mountains, as atmospheric conditions vary the effect of the sonic boom will vary also, as I understand it. I'm not an expert on it but whether or not it even reaches the ground is an element, or it depends on what the atmospheric conditions are at that particular moment, what the winds are, so there's no way to accurately say what the effect will be between the mountain ranges.

MR BALDWIN: Here at times, and I've only heard one plane flying, and I have heard two booms, and shortly after, one that is louder than the one I heard at first. That's why I wanted to ask if anybody has done any studies or any research in the low-lying areas.

COLONEL STAMM: Let me preface what I'm going to say by the fact that I am not an expert in sonic booms by any stretch of the imagination but I think normally with the two sonic booms, the second boom is normally louder than the first one. Very often, you drag a sonic wave across an area. The boom that is the leading edge against the area and then the second boom is the trailing edge in a compressed area and the second will be a lot a louder quality. So I think that might have been the case of those two reverberations between the mountains.

MR BALDWIN: Thank you, sir.

COLONEL STAMM: But I'm not an expert, let me assure you.

COLONEL RATCLIFF: Alright, thank you for your questions.

MR BOB MILLER: Bob Miller, Fort Davis, Box 291. I would like to ask Colonel Stamm. You've said that you need a forty by fifty mile area, is that correct?

COLONEL RATCLIFF: Let me get the question here first, and then we will see whether Colonel Stamm will answer it or someone else.

MR BOB MILLER: Is forty miles wide the narrowest you can get by with?

COLONEL RATCLIFF: Alright, Colonel Stamm, are you the one that should answer that, or is there someone else that would be more knowledgeable?

COLONEL STAMM: I think the answer to that really is, that if I had an area that was one hundred by one hundred, I would be much better off, very frankly. The more airspace that I can



expand the flight out to with the systems that we're looking at, if I can stand back and allow the magic machine to do its work, turn the radar on and see what's out there, allow this individual to work tactics on me, to deploy my machine to eventually achieve a solution, weapons solution on him. The wider, or the larger the area that I can employ that scenario in, the more advantageous it is. I can work in small areas. I would hate to try and give you, or quantify what the minimum size is. I think what we're talking about is probably a minimum size. If you're talking about making the area narrower, what you've done is you've funneled. What we would do in this instance, let me just describe that to you if I might. We would send one two-ship element off to one end of the area and other two-ship element off to the other end of the area and over the radio we would acknowledge the fact that we are both ready to fight and then we would go "head up" and try to "end run", try to come up from underneath, come in from the top, or split, do a pincer type attack on the elements coming up, all of those sorts of things. The more we compress that, the less practice we actually receive at the time we deploy the weapons system. So really, if you're talking about compressing the area further, yes it would have an impact on how effective it was.

MR BOB MILLER; You could get by with a twenty by thirty, or you could not?

COLONEL STAMM: That's what I'm saying, I would not quantify it, because in reality I would like even a larger airspace. We compressed it as much as we thought feasible to try and avoid some of the very sensitive areas that exist in this area.

MR BOB MILLER: Would it shut down your program to lose the forty by fifty area?

COLONEL STAMM: Would it shut down the program?

MR BOB MILLER: Right, or severely impair it?

COLONEL STAMM: It impairs the training effectiveness that's why we're looking for a supersonic, a place to do supersonic training. Yes, we can train subsonic but when we actually go to deploy the weapons systems in a real-life situation, where we're talking life and death, we will not be as effective with it as if we have trained to the full extent with it in a peacetime environment. That's the concern.

MR BOB MILLER: So anything less than the forty by fifty would be--

COLONEL STAMM: Yes yes it would.

MR BOB MILLER: It would impair the program?

COLONEL STAMM: Yes, it would.

MR BOB MILLER: Thank you.

COLONEL RATCLIFF: Mr Voigt, you had another question?

MR VOIGT: Surprisingly, it will be very brief and no quotation this time. They are avoiding Valentine by five nautical miles, but you're flying directly over Candelaria and Ruidoso. Why aren't you avoiding those two villages?

COLONEL RATCLIFF: Can anyone address this?

Major Graham?

MAJOR GRAHAM: Candelaria and Ruidoso are both in Mexico.

MR VOIGT: They are in Mexico?

MAJOR GRAHAM: That's right.

MR VOIGT: Who moved them? When did that happen?

MAJOR GRAHAM: I'm sorry, you're right. No sir, we do not avoid them by five miles. The population is not as great as Valentine and there is no school in either Candelaria or Ruidoso.

COLONEL RATCLIFF: You need to speak up please.

VOICE FROM THE AUDIENCE: Speak up.

COLONEL RATCLIFF: Major Graham, you might need to repeat that so that the people back there could hear because I don't think they could hear what you were giving for an answer.

MAJOR GRAHAM: No, we do not plan to have a five mile circle around Candelaria or Ruidoso.

COLONEL RATCLIFF: And would you explain once again with regard to what you stated as to the size?

MAJOR GRAHAM: I do not know the exact population but they are less than Valentine.

COLONEL RATCLIFF: I believe you indicated that there was no school at those locations, is that correct?

VOICE FROM AUDIENCE: There is a school in Candalaria.

MR VOIGT: Oh, yes. I know the teachers.

COLONEL RATCLIFF: I think as to your question, certainly the indication was that they were not going to be avoided.

234 MR VOIGT: Alright, that would get it to a supplemental question then, where is the dividing line, the population, where you are going to hit and where you aren't? The reason I ask is this, by taking this same CDNL figure and raising the decibel level as a result of daylight and five day a week flights only, this also raises the numbers in the ellipsis which are shown, as I believe, fifty-eight, fifty-two and forty-six, or some such numbers, it would have the effect of raising those four and a half points as well, which may bring them over the HUD acceptable level, so where is the population set-off? 234

COLONEL RATCLIFF: Alright, is there anyone that can answer that as to whether there is a population set-off and if so, where is that line drawn?

Apparently there is no one who can provide a response to that at this time.

Thank you, Mr. Voigt.

MR VOIGT: Thank you.

COLONEL RATCLIFF: Alright, unless I see another hand at this point I am going to go to the statements. I do not see any indication of any further questions. At this time then, we are going to turn our attention to those of you who have indicated that you wish to make a statement. Let me ask first of all, as to whether there are any other forms that have been filled out and I think we do have any because I want to get all of these.

Let me make some preliminary remarks with regard to the statements. Just as we've done in this past proceeding, we would ask that the individual who is going to make the statement, if you would, come to the microphone and indicate your name and your address. If you are speaking on behalf of an organization, if you would please identify that fact and also identify the organization or group that you are speaking on behalf of.

As I indicated initially, that those who are simply speaking for themselves, we will allot five minutes. And if you are in fact speaking for a group, then we will allow you ten

minutes. Captain Flanagan, who is sitting up here next to the podium, is going to be our timekeeper and when you are within one minute of the expiration of your time, then she is going to let you know that you have one minute remaining and we will proceed along that particular order.

Let me also indicate with regard to the nature of the statement that of course, it may be made strictly orally, you certainly may read them, if you desire to, if you have a written statement. If you have a written statement and you do not wish to either read it or whether you read it or not, it can be attached to the record. I would ask that if there is anyone here that has a statement that you are not going to read, if you see to it that before this proceedings is over that you have called this to my attention, and we will see to it that I obtain that statement and that it is of course, attached.

I would also call to your attention once again the fact, as was indicated during the briefing by Major Graham, that you may not have come prepared for a statement, or you may have already determined that you want to wait and see just exactly what occurs this evening and then prepare it in accordance with what has been indicated then, you will have until the 4th of November to submit a statement should you so desire. Now, it will help if your

statements are factual in nature. I'm not going to by any means tell you what you can say or not say, and some of you have raised in your questions some indications of what is it that will help as far as what you're trying to put across. I think if you can be factual as to what you have to say in your statement, if you have authorities of any kind that can be cited that can be referred to if need be to ascertain whether what you're saying is correct or not, certainly things of this nature would go, I believe, a long way in trying to present just exactly the things that you have in mind.

I might indicate of course, with regard to the statements that it is not the anticipation of the Air Force to respond to your statements, and the fact that you may make some statements as to certain things or certain matters that you consider to be facts and you are presenting them as being true, the fact that the Air Force does not respond one way or the other to your statements is no indication that the Air Force is therefore either accepting or rejecting factually what you have had to say. I simply remind you again that the purpose of this part of the hearing as well as the other portion is to give you an opportunity to state a particular position, the feelings that you have with regard to the environmental impact as far as this proposal is concerned, how it is going to affect your community.



We will proceed then. The first one, and I haven't put these in any particular order, I think basically, I've taken them pretty much as they have come in and put the latter ones at the bottom. If, in some way or other, I mispronounce your name, I will look to you to correct me as you come to the microphone and please accept my apologies in advance if I do mispronounce your name.

Mr. Voigt, it just so happens that you are on the top of the list.

MR VOIGT: I was hoping I would be last. Thank you. I can go home early.

I would like to preface this by one thing, I'm going to use the word "you" instead of repeating "Air Force", "Air Force".

COLONEL RATCLIFF: And even though you may have in some of the others, may have already given your name and address, please do so again. And I might say also that the address that you give, for those of you who are thus participating and expect to receive a copy, this is where the address is going to come from, so unless you have some reluctance to give your mailing address, it would be

desirable if you give a complete mailing address so that something can reach you.

MR VOIGT: Right, my mailing address would be Star Route 1, Box 44, Fort Davis. R. W. Voigt, V-O-I-G-T.

In Reserve, a few years ago, eight hundred people showed up at the last Air Force meeting.

COLONEL RATCLIFF: I hate to interrupt you, but I believe you may be speaking for an organization?

MR VOIGT: Oh yes, I am speaking for the Council for the Preservation of the West Texas Frontier.

COLONEL RATCLIFF: One reason for asking also is that Captain Flanagan will stop you at five minute rather than ten.

MR VOIGT: And the Council address is Box 400, Fort Davis 79734.

In Reserve, eight hundred people showed up at the last meeting there and it lasted until three-thirty in the morning, until it was forcibly adjourned by the Air Force, they were mighty tired.

At Sells, Arizona, the meeting lasted for ten and a half hours. In Valentine we had half the population here and a four hour meeting and all that did ail us no good. Sells is presently being boom-barded, high level and low level, to death. Now you're here and shortly you will be up in Reserve doing the same thing, and after, the same thing.

Consequently most of the population here decided to stay home this time, according to our survey, both because they feared talking here would do no more good than at Sells or at Reserve or at Valentine before, but mostly in order to help us keep the meeting short, sweet and to the point.

At the meeting here in 1977 we were told by then Commander of 49th TAC, Colonel Richard Meyer, that if enough of us opposed your turning these private lands into an aerial battlefield, you couldn't. We therefore presented petitions signed by 95% of the residents owning most of the land here. We presented them to you, our Representatives, our Senators and Secretary of the Air Force. It was all in vain because here you are again with another Environmental Impact Statement.

In studying this DEIS, we charge the Air Force with incomplete compliance with the spirit and the letter of the

National Environmental Protection Act, by obfuscation, concealment and incomplete presentation of all the facts as follows.

235 Item One. One of our questions exposed the Great Arizona Adobe House Hoax. Now in both your 1978 and this EIS you claimed the results of that test show no damage will occur to adobe or other structures. You did not discuss that it had only one sonic boom and that the testers found it disappointing and inconclusive.

236 Item two. One of our questions revealed the complete reindeer fairy tale. In this test you told us in both EISs that they merely lifted their heads when they were sonic-boomed. You did not reveal the test was made in the wrong time of the year - that booms can negatively affect their reproduction, that reindeer are never corralled during thunderstorms or sonic booms because they panic and they stampede. And other points brought out, were brought out against sonic booming of reindeer. In fact, you didn't say a word about the test admittedly being flawed. And I'm quoting from the actual report, from the test.

237 Item three. In your CDNL you didn't explain why you took 100+ decibel booms which you plan to emit over 3120 hours a year and then divided them into the full 8760 hours in a year so they wouldn't sound so bad or affect our health or damage our

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structures because they all average out to only 64 decibels that way. If we hear a 100 decibel boom one day is it fair to say it was only 20 decibels because it was the only one that happened that day? No, the equation was designed to bring the average below the HUD acceptable and the EPA acceptable range. But, when your numbers are calculated over 3120 hours, the five days, daylight hours you plan, it is way above HUD and EPA standards.

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Item four. That same false equation shows that only six people will be highly annoyed by your booms, when 97% of our residents proved that this was totally false. Just as more than 20% in White Sands, of the 150 residents there, are highly annoyed. Just as 27% in Oklahoma City during a six month test; 35% in St Louis and 55% in the towns--the people in the towns around Edwards Air Force Base are highly annoyed. How can you say in this equation that only 1% are going to be highly annoyed here?

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In all the references we were able to get hold of we find you deliberately selected the best and held back the worst information such as in the cases I just mentioned. And that raises the very serious question - how many other statements are equally suspect of concealing pertinent and damaging facts - pertinent to us and damaging to you. How many other statements were taken out of context? It will be necessary for the

decision-maker to have all the facts but he won't have it if there are any more examples like the ones I just mentioned.

239 Therefore, we ask, first, that we be given copies of all your references, cited or otherwise, so that we may thoroughly study them for similar deletions, incompleteness and improper use because we now suspect all of your statements in the DEIS. 239

240 Second, the DEIS says on Page 3-14, I quote, "An attempt should be made to obtain more critical evidence of the effect of sonic booms on health", just what we've been telling you for six years. Well, the Navy has now contracted for just such a study and we ask that any Air Force decision to implement the aerial battlefield here be deferred until the study has been completed and analyzed by everyone concerned. 240

Third. In view of the flaws herein as described in the 95 point critique, plus six supplements, the 31 point Economic Impact Study and Dr Worthington's proposed report, which we are going to present to you and the further criticisms we have found after we've studied your source material, we ask that this DEIS again be redrafted.

241 Fourth. We want that DEIS also to contain the promised copy of Dr Worthington's 1979 report, the AF reply and his rebuttal and refutation, instead of being hidden away from us in some other MOA's EIS as it was before, when it was hidden in the Reserve DEIS, of all places. 241

Fifth, we want, as promised, copies of our petitions, our maps and all the supporting resolutions opposing this battlefield also to be published in the new DEIS as it was supposed to be published in this one.

242 Sixth, we want to know what 25psf booms will do to cattle; and we want to know what a 50 to 100 ton impact to our water tanks will do, which is what five more inches of water, according to the DEIS, amounts to, to equal a sonic boom, five inches of water in a 100 foot diameter tank is 102 tons. 242

In conclusion, to see that these things are done, we're not going to rely on you as we did before to do them because that may be why this DEIS is so badly flawed. We gave you an eighty-five point critique with the previous DEIS. None of those points were ever addressed in this one. Therefore, we've determined to take our battle to the courts if we have to so that we may be fairly heard instead of, as here, being forced to deal

with the prosecutor, the judge and the jury, all wrapped up in one, so that our rights as owners of private lands will not be boom-barded away because we are so few and you are so powerful. Thank you.

COLONEL RATCLIFF: Thank you, Mr. Voigt.

The next speaker is Mr. Joseph L. Hood Jr.

MR HOOD: No comments. I think Mr Voigt summed up everything adequately.

COLONEL RATCLIFF: Very well.

The next speaker is Carl E. Ryan.

MR RYAN: Likewise for me, Colonel. We'll stand on Mr Voigt's comments.

COLONEL RATCLIFF: Very well, thank you.

The next one is Doctor Richard D. Worthington.

DR WORTHINGTON: Richard Worthington, 740 Tempic, El Paso, Texas.



Before I begin my formal remarks, I would like to go on record and say that I am absolutely appalled that in bringing so many Air Force people you failed to bring a qualified Flight Surgeon and a trained engineer who could speak to the details of this report and answer these people's questions.

Now, I would like to begin with a statement of Air Force Regulations, which all of you people in blue will know very well, but which the people in the audience will not be acquainted with.

Air Force Regulation 55-34, item 3, quote, "Commanders must take every precaution to protect communities and the civilian population from major invasions of the public domain through annoyances and risks associated with flight operations".

My specific comments concern Section 3.2.3.1, Sonic Boom Impacts on People, pages 313 to 318. I am preparing a lengthy critique of this section that will be available at the appropriate time.

243 | In reviewing your work, I have found the following, and I charge some of the following. Number one, a failure to consult key papers describing the effects of sonic booms on people. And I | 243

243 charge you with failing to consult at least half of the very specific studies that describe health effects of sonic booms on people, specifically startle response, habituation, and other types of events. In so doing, and in failing to do your homework, you have misrepresented some of the information that should have been in your report. And in one report, you have misrepresented the conclusions of that report. I also charge that you use a writing style using generalizations and carefully selected quotations that while technically correct, encourage the untrained reader to draw false conclusions of safety and this props up and supports the Air Force case in an unfair way. 243

You have also utilized quotations from studies that are conjectural, opinion studies, and are not supported by the bulk of the studies in the field.

In at least one instance in the health effects section, you have failed to consult the primary source, relying on some secondary quotation of that material and that particular study is readily available in any university library.

244 You have failed to present all the data on the different levels and degrees of annoyance. I can ask the question, how many people will be annoyed in this area, and all you've told us is how 242

many are going to be highly annoyed. If we go to the Oklahoma City Study, highly annoyed was less ten percent; annoyed to some degree was over fifty percent; and I point out that even in your own references, you cite papers that link the psychological state of the person with the health state. So annoyance values at all levels are important and you must include those in your studies.

You base almost all of your health effects work on the review study by CHABA. That study is now two years old and there are, in my opinion, fifty more relevant studies that you must cite to bring that work up to date.

In order to draw meaningful conclusions of health effects, it is necessary to know how many people live in this area in the different age brackets. You have no demographic studies to support data relating to health. For example, it would be nice to know how many people are over seventy years old, of both sexes. How many people. That would enable one to determine how many people might be hypertensive and so forth.

You have failed to consult physicians who might be able to answer key questions like what type of high-risk patients should not be startled two or three times a day. You have omitted one of the key papers that describes the effects of sonic boom on

248 hearing documents on a primate model, hearing loss in that type of animal, you have given three paragraphs saying there is going to be no hearing loss and there's a key paper that you completely overlooked. You have failed to consider the recent models that predict annoyance more accurately, you have a mandate to consider annoyance levels in all models that predict annoyance more accurately, rather than just comply with HUD and whatever guidelines are there. When human health is an issue you must do that. 248

249 You have failed to consider the double sonic boom effect and what it might do. 249

Over all, I find this Health Effects Report completely unacceptable because you have failed to consult key papers, you have misrepresented results because of the writing style which encourages people to draw false conclusions, you use the conjectural studies, your failure to consult primary source material, your failure to present all the pertinent data on annoyance which must be considered in health effects, and your failure to include demographic data. Thank you.

COLONEL RATCLIFF: Thank you very much.

Darrell York.

MR YORK: I've already spoken. I had a question.

COLONEL RATCLIFF: Did you have a statement that you likewise desire to make?

MR YORK: Negative on that.

COLONEL RATCLIFF: Alright.

Albert W. Miller.

MR MILLER: Mr Voigt just made my statement for me.

COLONEL RATCLIFF: Alright, thank you.

Corinna Flippen.

MS FLIPPEN: No statement.

COLONEL RATCLIFF: Roberta Hoy.

MS HOY: No statement.

COLONEL RATCLIFF: Thank you.

We have Mr. Calderon, the mayor.

MR CALDERON: No statement.

COLONEL RATCLIFF: Or is "mayor" the last name?

MR CALDERON: I am the mayor.

COLONEL RATCLIFF: Alright, I thought it was possibly that you were the mayor of Valentine?

MR CALDERON: Yes, sir.

COLONEL RATCLIFF: I'm very very glad that you are here and I am sorry that I had not met you previously.

Dr. Frank Grogman.

DR GROGMAN: I have no statement but I would like to publicly commend Mr. Voigt and Dr. Worthington for the splendid presentations they gave on behalf of us residents here tonight.

COLONEL RATCLIFF: I thank you for your comments, sir.

Clayton E. Weigart.

VOICE FROM AUDIENCE: He is not here.

COLONEL RATCLIFF: Richard Cinotto.

MR CINOTTO: My name is Richard Cinotto and my post office box is 277, Valentine. I wish I had more detailed information to make a statement from like a lot of the other people have, unfortunately I didn't know anything about this and I still wouldn't have if I hadn't bought a Sunday paper.

It's just still kind of a shock to me that anybody, including the Air Force, would come in here with this statistical nonsense that we have been presented with and told - well, sonic booms aren't really too bad for you but we're not going to do it over any populated areas because every time we have they have complained, there's been a lot of problems.

This Oklahoma City test that was mentioned earlier, I lived in Oklahoma City during that and I think it was annoying then and I think it would be much more annoying now. I am not in

the fortunate five mile range that's protective of Valentine, I'm in the big circle north where you're going to do all your booming. I realize that all of a sudden that family and myself, and in particular my horses, are now going to become a part of a great sociological environmental impact study that I'm going to be a guinea pig used in. I didn't volunteer for it, I wasn't asked - it's more like, you know, I'm almost being told as an after-fact. I realize we're gathering facts now and we'll all do better with them in the future, but it seems to me to use humans as guinea pigs, which is basically what we're doing, we've already heard plenty of people explain that maybe the research at best is lacking and that's using the best experts you can get, not necessarily the best experts you can hire with your point of view. It seems that we have no recourse. I guess what I'm looking for is justice in this thing. You know, I want to raise horses in the area of your big boom pattern out there. I've already had the experience two years ago of almost breaking my neck when a horse bolted because the sonic boom - before the rules allowed it - we're getting back to the rules again, you know, there have been booms happening here in this sub-boom area, I can imagine how wonderful the booms are going to be once they are really legally allowed to do it.



It just seems to me that if the Air Force can come in and boom me out of the business of raising horses, or being around them when they are out playing, it seems to me that the proper thing ought to be done that you ought to come in and condemn our land, take it from us, pay us the value, and get us the heck out of here and let you do your booming. But if we're supposed to live here and have the rights as citizens of the United States to determine our own destinies, that doesn't mean that we should--if we're opposed to people coming and making loud explosions on our land, I think that we ought to be able to prevent it and it's obvious the majority of the people here and every other place that the Air Force has set up sonic booms, the people are opposed to it, but it's like the best good for the most people, or whatever, you go ahead and do it anyway. I don't think that's necessarily the best thing that can happen here. The fact that the Air Force can't fly enough missions doesn't mean the Air Force can't move somewhere else. Or they can move half their wing to Florida and rotate. There's a lot of other options. The way it's presented to us, if they don't get to fly here the Commies will be in our back yard tomorrow, and I think that's utter nonsense. It's a case where maybe the Air Force has too many airplanes in a small area. I don't see that I should pay the price and unless the Air Force is willing to condemn my property and move me out for my own benefit, I don't want them here using me as a guinea pig to see the long term effects of sonic booms. Thank you.

COLONEL RATCLIFF: Thank you very much.

Now this is the last of the slips that I have but as I indicated previously, this doesn't mean that anyone else that desires to make a statement is going to be precluded from doing so. So I would like to see if there are others that desire to make a statement at this time.

Alright, we have two others that have held up their hand. We would, of course, ask that you do along the same lines that we've already established, that you come to the microphone, that you indicate your name and your address and unless you indicate that you are speaking for a group it will be assumed that you are speaking on your own behalf.

MS CINOTTO: My name is Candice Cinotto, Post Office Box 277, Valentine.

In the past two years since I've lived here we've had several sonic booms, more than one a day on several occasions. I am a teacher, I saw one student fall out of the desk. I have been around large animals when a sonic boom has occurred. I would not

choose to be around large animals when a sonic boom is going to occur, not knowing when it is going to occur, that's impossible.

Most of the people in this room probably feel that sonic booms are important. I don't happen to feel they are important. A great philosopher once said "love thy neighbor". I wonder how he would feel about sonic booms. I wonder if--where sonic booms have to be forced upon us when we don't want them all. You're trying to put them on us because there are just a few of us here, but the few of us that are here are here because we like quiet, we like peace, we do not like war, or we would be living in your cities and be in your military, we would be playing war.

My father is a colonel in the Air Force. My father-in-law is a colonel in the Air Force. My husband has been a captain in the Navy, in the Army. Many people in this country do not choose war and military as a way of life. Now we do not outnumber those who do, but we exist. I would prefer to not have sonic booms at all, much less in my community. Thank you.

COLONEL RATCLIFF: Thank you very much.

We had another hand.

MR ANDERSON: My name is Clyde Anderson, General Delivery, Valentine, Texas.

I would like to commend the Air Force on their attempts to save money by wanting to be close enough to their own base to where they can, within a reasonable amount of financial expenditure, do their testing, but I find it totally unreasonable that the system that spends more money than they can possibly use and at the time of the end of fiscal year went on a shopping spree and spent - I'm not sure how much money, I lose track over millions and billions, but I can't imagine the Air Force wanting to save money when they have an opportunity to go to Florida and spend more money and do a better job and have more opportunity to be more aggressive, I just don't understand why they want West Texas. And I for one, although I'm not sure what my future in West Texas lies, I don't want it to be underneath a sonic boom. Thank you.

COLONEL RATCLIFF: Thank you.

Were there any others who desired to make a statement?

(No response)

Are there any present who have written statements that you would like to hand in at this time that of course would be made a part of the record. If you do, I would like for you to of course come and indicate your name and your address likewise, if you are submitting a written statement so this will be reflected on the record.

Are there any written statements of any kind?

Alright, apparently there are none at this particular time. I would indicate to you again that you do have then until the 4th of November of 1983 in which to submit a written statement and the address that I have would be Headquarters TAC, would be abbreviated, as most of you already know, it would be just an H-Q, and then TAC, then a slash, DEEV. And that would be Langley Air Force Base, Virginia, the zip code - 23665.

VOICE FROM AUDIENCE: Would you go through this again, please?

COLONEL RATCLIFF: Headquarters TAC, and that of course is for Headquarters Tactical Air Command, and then a slash mark and the letters, capital letters, DEEV. These of course are the symbol for the particular office there at the headquarters for

that air command. And that would be Langley Air Force Base, Virginia. The zip code is 23665.

I might indicate, of course, normally a two-week period is given, but as was indicated that the date, and it was indicated on the slide, that it would be 4 November so that will give you about another ten days over what might normally apply, in any event, 4 November.

This then, concludes the hearing and I wish to express my appreciation to each and every individual who has been a part of it. I would like to express appreciation too for being here and I would like to express appreciation likewise for the manner in which everybody has conducted themselves. I think you have certainly let your feelings be known and you have expressed it in a very appropriate manner and that's what the hearing is for and I commend you for the interest and for that which you have indicated. As I have indicated also as I do not have any part in the decision-making process, I do not have any part in making recommendations, or anything of this nature. But be that as it may, I do appreciate your being present and for your participation in this hearing.

MR VOIGT: May I say, Colonel Ratcliff, this is the finest meeting we have ever had. It was conducted beautifully and it stands in high comparison to the shambles we have had before, which were conducted very poorly.

COLONEL RATCLIFF: I thank you very kindly and believe me, even though there may be some obvious disagreement as far as to how this should be handled and from the standpoint of possibly what's being presented in the Environmental Statement versus what you may feel, differences will often exist and I am sure they exist even here within this community. It should not prevent us on an individual basis from being friendly and from conducting ourselves in a proper manner and that's one of the reasons why I have commended you because I think that you have indeed conducted yourselves just as you would expect the people from a community as this to conduct themselves. So thank you very kindly and the meeting is adjourned.

(The meeting adjourned at 2245, 11 October 1983.)

CERTIFICATE

I, Sharon R. Krallman, do hereby certify that the foregoing pages numbered from 1 to 109 inclusive, constitute a full, true and accurate transcript of the proceedings of the public hearing held in Valentine, Texas, on 11 October 1983, all done to the best of my skill and ability.

Sharon R. Krallman  
Sharon R. Krallman, DAFC  
Court Reporter

28 October 1983



AF  
RESPONSES  
TO  
PUBLIC COMMENTS

## COMMENT RESPONSES

- 1: The Air Force appreciates the concern expressed by Congressman Coleman. It is emphasized that the difficulty of having "definite knowledge" is a problem in proving a negative. No one can ever prove that noise does not have an effect on the health of people, but even effects do not necessarily result in cumulative clinical pathology. Based on the collective knowledge and consensus of the scientific community, the Air Force believes the level of overpressures to be experienced at intermittent intervals are neither sufficiently intense nor frequent enough to be considered a significant impact from a health standpoint.
- 2: Conclusive evidence does not exist to show that noise at the proposed levels adversely affects the health of people. A direct cause and effect relationship has not been demonstrated between noise exposure and adverse health effects in any study using human subjects. Worthington's statements should be compared to those of Thompson. Dr. Shirley Thompson of the University of South Carolina School of Public Health summarized her research team's "evaluation of the epidemiologic evidence available regarding the effects of noise on the cardiovascular system" in a paper given at the May 1983 meeting of the Acoustical Society of America. (A summary of EPA reports having NTIS designations PB 82-147752, PB 82-147760, and PB 82-147778.) Of some 800 potential publications, 83 were chosen for critical review. Each selected article was critiqued independently by an epidemiologist, a cardiologist, and an audiologist. Individual critiques were then integrated for study summary. The conclusion derived by the reviewers, plus an additional set of consultants was: "Our analysis indicated that studies to date are inadequate for establishing cause-effect relationships between noise and cardiovascular disease. Recommendations made were aimed at improving study designs for future research." In terms of adequacy of current research Thompson summarizes the results of the evaluation process as follows, "The relatively poor quality of the identified papers is reflected in the individual component and overall ratings of the reviewers---The proportions of studies meeting more than fifty percent of the evaluative criteria were as follows: On the noise component, 6% of the English studies and 11% of the translated research; on the health outcome component, 33% of the English and 32% of the translated research; and on the epidemiologic methodology component, 42% of the English literature and 11% of the translated studies. When the lowest of the three component scores is taken as the overall validity score, no study reported in the English literature and only one in the translated literature was rated higher than "4" on the 0-9 scale.--these ratings indicate that the literature is less than full informative for the task of judging the association between noise and cardiovascular effects." These reports by Thompson represent a milestone in noise research and hopefully a precedence has been set for future evaluations of research in this area. The bulk of the available scientific evidence suggests that noise levels that would yield "hypertension, ulcers or pregnancy problems" are considerably in excess of those that will characterize the Valentine MOA.

Due to the subjective nature of individual responses to noise, active campaigns against a proposed flight program will frequently generate multiple anticipatory complaints far in excess of those occurring during the actual program. Some commenters have requested a worst case analysis of health effects; this is addressed in the accompanying summary.

- 3: While the alternative of flying up to 600 supersonic sorties (see paragraph 4.4.3 of the RDEIS) has been analyzed (it is pointed out that this is a viable alternative for the decision maker to consider), the preferred action is to split the sortie shortfall between the Valentine and Reserve MOA.
- 4: Congressman Coleman's offer of assistance is appreciated. However, our dialogue with the Army has been fruitful and maximum cooperation is evident. The Army conducts national priority testing for the Navy, Air Force, National Aeronautics and Space Administration, and foreign governments. The Air Force does not see where White Sands Missile Range's (WSMR) prediction of 600 sorties per month allotment to the 49 TFW would change. The subject of continued support of the 49 TFW mission at WSMR was discussed in February 1984 between Senator Bingaman and Major General Fulwyler, Commander of WSMR. The conclusion of that discussion supports the position stated above and as included in the RDEIS.

The Air Force has reviewed areas within 150 NM of Holloman AFB, including public lands, and concluded that the Valentine and Reserve MOA's are the only feasible alternatives.

- 5: The Air Force appreciates the concern EPA raises about additional mitigation for sonic boom impacts in the Valentine MOA. Paragraphs 4.2.1.2 and 3 of the RDEIS addressed the use of inflight refueling and temporarily locating units to satellite locations for over-water supersonic flight and concluded these were not feasible alternatives. Additionally, the Sells MOA and its inhabitants currently experience more sonic booms than that projected for the Valentine MOA.
- 6: While there may not be an abundance of published literature on long-term effects of sonic booms to animals and wildlife, one must not overlook the experiences of 25+ years of supersonic operations on the Luke and Nellis AF Ranges, both of which contain National Wildlife Refuges (NWR). The Luke AF Range provides habitat for a wide range of animal and wildlife species including desert bighorn sheep, sonoran pronghorn antelope, javelina, gambel's quail and white-winged doves. The range lies within the path of many migrating birds, who are common visitors mid-February to early June and again in the fall. During the summer, gatherings of white-winged doves at waterholes provide one of the desert's ornithological spectacles. The southern bald eagle, peregrine falcon and sonoran pronghorn, all on the Federal Endangered Species List, are known to be in the area. FWS comments in 1980, concluding Section 7 Endangered Species coordination, stated that continued Air Force activities on the Luke AF Range appear to be in the best interest of the sonoran pronghorn. A similar situation exists on the Nellis AF Range where bighorn sheep, horses, burros, mountain lion, elk, mule deer, antelope and a host of other animal and wildlife species including migrating waterfowl and wading birds thrive. The northern portion of the range complex was fenced in the mid 1970s to stop trespass cattle grazing. Since that time the number of horses has increased beyond the land's carrying capacity and now pose a management problem in population dynamics. After all these years of supersonic flight, the Bureau of Land Management (BLM) continues to receive requests for cattle grazing allotments in the Desert MOA.

- 7: Comment noted, see response #6.
- 8: The Air Force recognizes the link between water tanks and continued ranching operations. The link is further crystallized in the February 1984 National Geographic, "Texas West of the Pecos," by Griffin Smith, Jr., where he states..."cattle business is hostage to the weather: the number of cattle per section roughly equals the number of inches of rain per year. The search for water is the one abiding constant of life west of the Pecos." The Air Force does not believe water tanks would be significantly impacted. A carpet boom of 5 psf equates to raising the water level about one inch; a focus boom would be comparable to an increase of about five inches. In terms of a tank that is 13 feet deep, the increased pressure at the bottom from a focus boom (even using a dynamic amplification factor of two) is about seven percent more than the static pressure; for a carpet boom the comparable value is about one percent. The Air Force believes the water level in the tanks fluctuates more than this during the year, substantiating their capability.
- 9: Discussion provided in paragraph 9.2.3 of the RDEIS is considered adequate because the ground shock wave is the force of primary concern; however, air wave propagation down the well is interesting from an academic standpoint. Focusing and reflection would be within a few pipe or casing diameters of the surface; beyond that point the N-wave would quickly decay to a sine wave. The maximum effect at the air/water interface is to cause a reflection that would double the boom pressure. Using the analogy for the water storage tank (response #8), the effect is that of increasing the water level standing in the well by five inches. (This assumes no attenuation of the sound waves propagating down the casing.)
- 10: The Air Force believes sufficient navigation aids already exist to ensure positioning and maintaining of area boundaries.

In response to lingering concerns on the peregrine falcon, the following quote from David H. Ellis, Ph.D. (author of reference 104 in the RDEIS):

"The 1980-81 study shows that several species of raptors were remarkably tolerant of nearby jet aircraft. Sound bursts, in general, elicited some intense responses (including fleeing responses) and there is reason for concern that an adult bird may occasionally dislodge an egg or chick when fleeing from the eyrie after a sonic boom. We made no observation of an adult expelling offspring in this fashion but incubating adults did sometime flee, so the danger does exist. For the peregrine falcon this danger is moderated by the falcon's tendency to nest on broad ledges (where the risk of an egg or chick actually being propelled over the cliff is minimal).'

"All raptors nesting in the southwest are presumably conditioned to very loud sound burst (thunder) and cliff nesting raptors regularly (especially in wet weather) hear sound bursts associated with rockfalls, a natural phenomenon potentially more dangerous to the incubating adult than a distant sonic boom.'

Considering the result of the 1980-81 study and the natural adaptiveness of raptorial birds, it is my professional opinion that high altitude sonic booms will have no population limiting effects on the peregrine falcon in the Southwestern United States. It remains to be demonstrated that even one falcon egg or chick has been lost due to high altitude sonic booms. While it may be that certain species in certain areas will exhibit population limiting responses due to high altitude sonic booms, this notion is not supported by the result of the 1980-81 study performed in Arizona."

- 11: See response #10 above.
- 12: See response #10 above.
- 13: In a 9 March 1984 telephone conversation with the Air Force, the Texas State Historic Preservation Office agreed with the Air Force that a programmatic Memorandum of Agreement is not necessary at this time. The Air Force is committed to continue to work closely with the SHPO's office.
- 14: Paragraph 3.2.3 discusses supersonic flight within the MOA. The effects of sonic booms should be within the operational area and are not expected to impact outside the MOA. The areas of concern in this comment are outside the MOA.
- 15: The initial draft EIS was filed in July 1979 and was prepared to meet the CEQ guidelines then in effect. For continuity, the Air Force has elected to continue processing this proposal's EIS under the original format. While there are minor differences in the format and technical requirements, the EIS does an adequate job of evaluating the environmental effects of the proposed action and alternatives and does provide the decision maker a basis for a sound, reasoned choice. A list of preparers is provided in this document.
- 16: The Air Force has evaluated all reasonable alternatives identified within the agency and through public comments. Where suggested alternatives were considered not feasible, the reasons have been so stated. The EIS does include the alternative of no action, and clearly indicates the Air Force's preferred alternative is the proposed action. The Air Force does not agree that another draft EIS is warranted.
- 17: This comment is in error. The statements relating annoyance to exposure in the RDEIS are derived from the dose-response relationships evolved from the Oklahoma City and Edwards experiments. The relevance of calculating expected annoyance in advance is that this is the only thing that is feasible. Subjective human responses to noise as estimated by CHABA can be forecast to have a high degree of reliability because the findings of psychoacoustics are now among the most reproducible in biological sciences.
- 18: The Ellis study is discussed in paragraph 3.2.3.2. Data/discussions provided in the RDEIS on impacts to peregrine falcons supplant that contained in the initial EIS since a two-year specific study was

conducted to evaluate the effects. The RDEIS reports a no effect determination. Also see response #10.

- 19: Comment noted, see response #6.
- 20: The intent of citing the adobe house study in Arizona was to illustrate that it reacted in a similar nature to conventional construction, which there is an adequate data base for evaluation.
- 21: See Appendix I of the RDEIS. In addition to data collected in the Valentine area, data from another similar geologically based area was evaluated. This collective information was extrapolated in order to evaluate potential impacts. See response #13.
- 22: The Oceana model shows that effects of sonic booms should remain within the current MOA boundary and, thus, there would be no need to modify the eastern boundary. According to Dr. Harlan Smith, University of Texas, the Observatory's concern about the proposed supersonic flight centered on contrails and frequency range of various sound sources on the aircraft. After a discussion on contrails and noise, Dr. Harlan was satisfied that neither would be a significant impact to Observatory operations.
- 23: Comment noted.
- 24: Activation of thrust augmentation in the F-15 is considered to be a soft-light rather than a hard-light as employed in aircraft such as F-106's and consequently, should not be perceived at ground level as a sonic boom.
- 25: See paragraph 4.4.3 of the RDEIS. Also see response #3.
- 26: The Air Force has not overlooked either of the three towns. Shafter is located outside the MOA boundary, and in fact, Figure 11 highlights the Shafter historic mining district. Ruidosa is within the MOA boundary but outside the southern ellipse CDNL 44 contour. Candelaria is shown to be within the CDNL 44 contour and is identified as map key number 74 in Table 7. These towns would not receive many sonic booms because of wing procedures to avoid boundaries by 5 NM. It is not likely that an aircraft would be pointed towards any of these towns while supersonic because of the high turn radius at high speed. The Air Force appreciates the updated population figures for paragraph 1.8.2.
- 27: Figures correcting the number of lots will be made in paragraph 1.8.4.
- 28: Comment noted.
- 29: See paragraph 3.2.3 of the RDEIS. Based on the Oceana study and the 5NM buffer, the Air Force does not project Valentine, TX to be impacted by sonic booms.
- 30: Comment misquotes Galloway's letter. What was said was that if a 12 hour day were used, indeed the average sound level would go up 3 decibels, however, the relative dose-response relationship would also be modified by 3 decibels. That is, on a 12 hour basis, 68, not 65 decibels would be

the HUD acceptability criterion. The Oklahoma City data were also daytime only.

- 31: Comment noted. Our reference citation is not intended to mislead anyone. We do believe it represents the consensus of the scientific community. Dr. Stanley R. Mohler, Wright State University School of Medicine, was Chief, Aeromedical Applications Division, FAA, during the period that the research by Collins, Iampietro and Thackray was conducted on sonic booms, coordinating the program research planning within which the studies were conducted. Dr. Mohler indicates the "extremely high boom levels" are well beyond anticipated booms in the Valentine MOA. Habituation to the proposed booms can be expected.
- 32: No, the reference cited for Rylander isn't the original, as stated by the commenter. The original is in Swedish.

Some few persons might initially have a small heart rate increase to low intensity booms. Such levels have never been shown to be of any health consequence.

Burns<sup>1</sup> and Kryter<sup>2</sup> point out after a review of the literature on physiological change induced by noise: the burden of proof is on those who say that such small changes are adversely related to health. The reason for this is well stated by Kryter:

"...the magnitudes of the physiological changes that are associated with these responses are rather small in comparison to the range of physiological responses or states observed in human organisms during homeostatic operations of the autonomic system normal to daily living. For example, in regard to this point, the greatest heart rate change.... is about 11 beats/min, from 75 to 86, and this for only 1 or 2 beats, and the peripheral blood volume changes last but for 10-20 sec or so. Consider that changes much greater than these occur from mild exercise, fright, sudden changes in air temperature, laughter, etc."

Burns<sup>1</sup> reaches a similar conclusion as Kryter<sup>2</sup> and both point out that the often quoted studies on peripheral blood flow by Jansen are not consistent and that they do not support an interpretation of an adverse effect on human health.

1. Burns, W., "Physiological effects of Noise" in Handbook of Noise Control, 2d Edition, Cyril M. Harris (Ed). New York: McGraw-Hill, 1979.
2. Kryter, K. D., "Extraauditory effects of noise" in Effects of Noise on Hearing, D. Henderson et al (Eds), New York: Raven Press, 1976.

- 33: See response #2. The studies by Peterson and coworkers cannot be uncritically accepted and indeed, they have not been either by the scientific community or by the EPA who sponsored most of the research. The past animal research needs to be critiqued in the same manner that Thompson has done for epidemiological studies. It is not just a matter of considering how the results of animal studies can be generalized to people (although this is important) but also the studies to date should

be critiqued in analytical detail. It takes only a casual reading of the literature to find studies with questionable statistical procedures, uncontrolled variables, and no control groups. Furthermore, studies have often used such a small number of animals (because of the expense) that it is doubtful that the results could even be generalized to the same species under investigation much less to other species and situations. Furthermore, in earlier animal studies the animals were often exposed to much higher levels of noise than human beings would ever expect to receive, and much, much, higher levels of noise than that of communities exposed to the noise of AF operations.

- 34: There is a danger in attempting to generalize from animal studies to the effect of sound on human hearing (see response #33 above). There are many steps one must go through, if it is possible at all, to establish a link between damage to animal ears and the meaning this has for human hearing. The main problems are (1) the auditory systems of different animals have different degrees of sensitivity and their relationship to the sensitivity of human beings is not clearly understood and (2) animal studies usually use much higher levels of noise than a human would ever be expected to be exposed to.

Studies with humans support the conclusion that no permanent hearing loss will occur. A study, although quite old, conducted by the Civil Aeromedical Research Institute in 1964, studied the effects of sonic boom on hearing. They report exposure of 23 male subjects, in the age range of 23 to 60, to 600 sonic booms of up to 16 psf produced no detectable alteration in hearing acuity.

- 35: This comment mistakes the 90 decibel A-weighted sound level of "several hours per day" with sonic boom exposures. The A-weighted sound exposure level of a 2.8 psf boom from an F-15 is about 90 decibels. The average sound level if two booms occurred in "several hours per day," say 3, is  $90 + 3 - 40 = 53$  decibels, or at least 37 decibels lower than CHABA recommendation. Instead of being "forty thousand times louder," the boom exposure is less than two ten-thousandths of the CHABA guidance.

- 36: See response #33. Traffic noise studies cannot be equated with sonic boom noise. Additionally, Kryter's paper is highly "accepted." It is supported by the reviews of Burns<sup>1</sup>, Thompson<sup>2,3</sup>, and Harris et al<sup>4</sup>. These reviews are the ones most respected and accepted by the scientific community working in the area of biological acoustics. The size of the physiological changes obtained in the article by Muzert and Enhart are not given. Small physiological changes induced by noise are not a direct demonstration or a logical demonstration of the adverse effects of noise on health. As Harris et al<sup>4</sup> have pointed out, studies are rarely conducted at an analytical level sufficient to demonstrate any link between physiological change and health. It is probably true that a study will never be conducted that can't be criticized and thus limited in their generality, and any decision should be based on the best understanding of all of the literature available and will be based hopefully on the weight of the evidence and not on the results of a particular study.

1. Burns, W., "Physiological effects of Noise" in Handbook of Noise Control, 2d Edition, Cyril M. Harris (Ed). New York: McGraw-Hill, 1979.



2. Thompson, Shirley J. "Epidemiology feasibility study: Effects of noise on the cardiovascular system: Annotated bibliography: Literature: The Effects of Noise on the Cardiovascular System," Report 550/9-81-103B, U.S. Environmental Protection Agency, Washington, D.C., July 1981.
3. Thompson, Shirley J. "Epidemiology feasibility study: Effects of noise on the cardiovascular system," report 550/9-81-103, U.S. Environmental Protection Agency, Washington, D.C., September 1981.
4. "Noise, general stress responses, and cardiovascular disease processes: review and reassessment of hypothesized relationships," Report 550/9-80-101, U.S. Environmental Protection Agency, Washington, D.C., June 1980.

37: See response #2.

38: See response #2.

39: "Highly annoyed" is used in a number of studies because it is generally better able to be defined in the analyses of social survey results. This leads to more consistent dose-response relationships when comparing one survey to another.

The quote of 50% of the Oklahoma survey respondents having some degree of annoyance is a good example. The survey showed also that the degree of response to sonic booms was matched by the respondents annoyance of local roadway surface maintenance. Additionally a few people complained of sonic booms at published scheduled times of flyovers when no actual flyovers occurred.

40: C-weighted sound level was not "devised for noises like traffic"--the commentator confuses C with A-weighting.

The Fidell article is concerned with blasting where the primary effect is due to ground-borne vibration, airborne noise being secondary. While this work was being done, Fidell was also a member of the CHABA Working Group that selected C-weighted sound exposure level for sonic booms and other airborne impulsive sounds.

The rate of growth of annoyance with increasing exposure to impulsive sounds is greater in the CHABA report than for non-impulsive sounds as developed by Schultz (who was also on the CHABA impulsive noise working group).

41: Comment noted, correction will made in paragraph 3.2.4.1.

42: Comment noted, correction will be made showing correct highway number.

43: Comment noted.

44: The table is not misleading; see paragraph 4.2.1.3 and Appendix F of the RDEIS. If the Air Force flew only 3600 sorties at Tyndall, the ultimate cost per sortie would be considerably higher than the indicated \$5,146.88 in Table 9. The point is that temporarily relocating a squadron and

flying only two-thirds of the aircraft would not be economically wise.

- 45: See paragraph 4.2.1.3 of the RDEIS.
- 46: See response #14.
- 47: See paragraph 4.2.1.3 of the RDEIS for discussion of factors for not relocating either the 49 TFW or 479 TTW.
- 48: See response #22.
- 49: The interpretation in this comment is not consistent with HUD or EPA methods. The equations used by the Air Force are correct. Also, see response #30.
- 50: Each claim will be considered fully and fair settlements made where there is reason to believe that the Air Force caused or contributed to the loss or damage.
- 51: See response #50 above. FHA and VA standards are not relevant. The question is whether Air Force activities caused or contributed to the damage, even to structures containing deficiencies.
- 52: The Economic Impact Study has never been designated as classified material. Some requests received prior to the document being completed were denied because the Air Force did not want to release a document before its acceptance from the contractor. Once the document was approved, it was made available to the public.
- 53: Comment noted. It is pointed out that SR-71 aircraft operate along AR-457 and do generate some sonic booms. There is also the possibility that a limited number of booms could have been generated by F-15 operations where an individual pilot inadvertently went supersonic. The latter, however, should not be experienced outside the MOA.
- 54: The inclusion of petitions and resolutions was considered and determined that they served little purpose in evaluating or understanding environmental impacts. Their real essence, to show opposition, was distilled and included in narrative form.
- 55: See response # 54 above.
- 56: See responses #50 and 51.
- 57: In addition to the one thousand questionnaires sent to the Marfa airport, one thousand were sent to the Valentine School Superintendent's Office. One hundred copies were subsequently provided for Fort Davis residents. The public was advised by radio and newspaper about the test and location of questionnaires.
- 58: See response #30.
- 59: Comment noted.
- 60: See response #20.

- 61: See response #50.
- 62: Espmark's conclusions of the test are as indicated in Appendix D of the EIS. The fact that he added a cautionary note for perspective should not be interpreted as stating the test was inconclusive or flawed. Authors of scientific papers reviewing the effects of sonic booms on animals, including Bell, Fletcher, and Rylander also report Espmark's conclusions as given in the RDEIS. The Air Force makes no interpretation of this data but provides a capsuled summary for information purposes.
- 63: The Air Force has been unable to find such reference to the peregrine falcon in the initial DEIS filed in July 1979. Paragraph 9.1.6 states, "To date there is no conclusive evidence which indicates that supersonic flight training has an adverse impact on the reproductive/fledging success of peregrine falcons." It also states the Air Forces initiated Section 7 Endangered Species coordination. The RDEIS shows after the two year study the FWS issued a no effect biological determination.
- 64: See response #30.
- 65: The entire positive and negative pressure variation of a sonic boom is included in C-weighted sound exposure level.
- 66: See paragraph 3.2.3.1 in the RDEIS and response #2. The Air Force has referenced the information used in the analysis.
- 67: See responses #39 and 40.
- 68: See response #40 and associated comment.
- 69: The profile data available are sufficient to allow forecast of population effects and responses. The Air Force does not believe collection of additional data would enhance the environmental analysis. Other than hearing loss, the levels of knowledge concerning noise induced health effects (at whatever level) is not refined enough for application to a detailed demographic profile. For example, there are no accepted quantitative data showing a material difference in health effects of female exposure to sonic booms versus male exposures, early childhood to teenagers or adults.
- 70: See response #33.
- 71: See response #2.
- 72: The research design for the Economic Impact Study required analysis of state, county, and local data both in terms of economic statistics and interviews with local officials within the MOA study areas. The contractor recognized the influence large towns and cities several miles from the MOA's would have and thus focused attention to towns within the study area to help reduce the metropolitan influence. A major factor in evaluating the four control MOA's was the understanding gained and data collected during the field visits within the study areas. This provided first-hand knowledge for the economist to evaluate the local conditions

as compared to state and county statistics. Certainly, subcounty economic data would have made the evaluation process easier and minor changes could have been analyzed for historic purposes; however, subcounty data was not always available so the next tiered step was county and state trends.

- 73: See response #14.
- 74: This comment concerns information in a background document. Where this information was used in the EIS, the data will be corrected appropriately. The Air Force's conclusions are not changed by consideration of this data. See response #26.
- 75: Comment noted. See response #74.
- 76: Comment noted. See response #74.
- 77: Comment noted. See response #74.
- 78: As indicated on page 211 of the Economic Impact Study, about two percent of the area's land was being used for agriculture endeavors with an annual income of two to three million dollars. When compared to ranching which uses about ninety-eight percent of the area's land and provides an estimated annual income of about 25 million dollars, farming must be considered to be a minor activity.
- 79: Comment noted. This area is outside the MOA boundary and should not be impacted. See response #74.
- 80: The Economic Study indicates no significant impact on real estate value.
- 81: Comment noted.
- 82: See response #39. Again, comment uses "highly" annoyed for any expression of annoyance.
- 83: See responses #10 and 36.
- 84: See response #50.
- 85: See response #20.
- 86: See response #21.
- 87: See response #22.
- 88: Comment noted.
- 89: See response #24.
- 90: Comment noted, establishment of the MOA is not a part of this proposed action.
- 91: See response #26.

- 92: The Air Force does not believe supersonic activity will negatively impact any of the recreational activities.
- 93: Comment noted.
- 94: See response #27.
- 95: Comment noted.
- 96: See response #27.
- 97: See response #29.
- 98: See response #30.
- 99: One assumes that this is work of Knipchild's. If one looks up the critique of these studies by Thompson (see question 2), one can determine that Knipchild's studies do not support his conclusions and that many variables were confounded which precluded a cause-effect conclusion and further that no "Statistically significant differences" were found. It is enormously difficult to conduct a good epidemiological study.
- 100: The Navy has not commissioned a health effects study. They are preparing an environmental impact statement for supersonic operations at Fallon NAS.
- 101: See response #39.
- 102: See response #30.
- 103: See response #41.
- 104: The number of eating places will be corrected in paragraph 3.2.4.2.5.
- 105: See response #42.
- 106: The Air Force appreciates the updated population figure for Valentine. Correction will be included for paragraph 1.8.2.
- 107: Comment noted.
- 108: See response #44.
- 109: See response #45.
- 110: See response #47.
- 111: The percent highly annoyed figures are based on noise levels. The methodology used by the Air Force for analyzing impacts at WSMR and Valentine is the same. The number of complaints at WSMR correlates well with the projections derived from the noise methodology.
- 112: See response #30.
- 113: See response #21.

- 114: See response #22.
- 115: See response #111.
- 116: See response #30 and 49.
- 117: See response #24.
- 118: See response #29.
- 119: See response #50.
- 120: Comment noted.
- 121: See response #54.
- 122: See response #54.
- 123: See response #50.
- 124: See response #57.
- 125: See response #111.
- 126: See response #30.
- 127: See response #20. Col Johnson merely meant that to conduct a self supporting investigation one would require the analysis of a number of booms in order to get an association between the level of the boom and the likely resulting damage. He did not infer that the questioned test was of no value at all.
- 128: See response #62.
- 129: See response #30.
- 130: See response #44.
- 131: See response #20. No place is likely to get more than 500 booms per year (worst case).
- 132: Comment noted.
- 133: See response #8.
- 134: See response #72.
- 135: See paragraph 3.2.3 and Appendix D of the RDEIS.
- 136: The Air Force appreciates the updated population figures which will be reflected in paragraph 1.8.2 of the EIS.
- 137: See response #74.
- 138: See response #42 and #74.

- 139: See response #27 and #74.
- 140: See response #104 and #74.
- 141: See response #74.
- 142: See response #14 and #74.
- 143: See paragraph 1.8.4 of the RDEIS where the correction has already been made. See response #74.
- 144: The footnote on page 245 of the Economic Impact Study indicates the statement was made by the Texas Parks and Wildlife Department's Game Director in a telephone conversation on April 1, 1980. See response #74.
- 145: See response #74.
- 146: See response #80.
- 147: See response #74.
- 148: The Air Force's decision to publish a Revised Draft EIS was based on public request and length of time between the initial draft and the revised draft. Field experiences and observations reported in the initial draft are now supported by special studies and state-of-the-art modeling. The Air Force believes the public has a right to review this data before a final decision is made and consequently gave the public that opportunity. In no way should the Air Force's decision be interpreted as indicating the initial draft was inadequate.
- 149: See response #15.
- 150: Supersonic and subsonic flight in the Sells MOA began prior to the National Environmental Policy Act (NEPA), thus the ongoing NEPA process to analyze continuation of this activity should not be viewed in the same manner as if it were a new area. The Air Force's need of the area to maintain combat aircrew readiness balanced against an understanding of environmental impacts of supersonic flight results in continued use of the MOA while the NEPA process is conducted.
- 151: The term "set aside" as used in paragraph 1.1 of the RDEIS does not mean to literally restrict or segregate. It means to identify, list, or approve the area for supersonic flight.
- 152: The Air Force is not aware of any definition for a MOA that provides a legal basis for stating the operations conducted therein are ultra-hazardous. MOA's are established under criteria provided in FAA Handbook 7610.4, "Special Military Operations", and FAA Handbook 7400.2, "Procedures for Handling Airspace Matters". The proposed action meets the criteria identified in these handbooks. One of the purposes for designating and charting a MOA is to improve safety by alerting civilian pilots to areas where military aircraft are operating. Additionally, the F-15 has onboard radar that further enhances the area control provided by FAA.

- 153: A generic EIS is allowed under regulations implementing the National Environmental Policy Act (NEPA), but it is not a required procedure. Although the other proposals have similar timing, the impacts are not cumulative, nor are the proposals connected actions (where one is interrelated or dependent upon another). In addition, the Air Force has seen no compelling purpose in a generic EIS. The EIS on "Supersonic Flight Operations in the Valentine MOA" places the potential impacts in a specific context, analyzing both those factors which are common to such supersonic flights and those factors which are unique to the individual locale. A generic EIS, on the other hand, would be a generalized discussion of supersonic impacts, based upon the same scientific analysis and data base, but without the benefit of analyzing such impacts in a concrete situation.
- 154: The Air Force chose to provide environmental analysis based on overpressures rather than Mach number and altitude. Consequently, data reflected in paragraph 3.2.3 of the RDEIS does include the Mach 1.5 supersonic event. From a statistical standpoint, both methods show comparable values; however, overpressure analysis provides a straightforward approach to answering questions on number of events one could expect to hear and percent of booms expected above a given value.
- 155: See paragraph 3.2.3 of the RDEIS where additional studies on superbooms are provided.
- 156: The comment indicates that complaints were used to derive percent "annoyed" which is not true. Three rounds of social surveys which included urban, suburban and rural subgroups, were used to obtain dose-response data. Extrapolated data from the study can be applied with confidence.
- 157: See response #155.
- 158: The French "Jericho" test data, along with consultation with the United States' representative to that test, provide a significant basis for the analysis provided in paragraph 3.2.3 of the RDEIS. What appears to be at variance is an understanding of the focus phenomenon in respect to cutoff Mach number; which is covered in paragraph 3.2.3 of the RDEIS. The commenters "quote" is misleading in its first sentence and wrong in its second. The fact that a theoretical focus boom is produced as an airplane goes supersonic does not mean that it reaches ground level. In most instances the rate of acceleration and height of the aircraft will cause the focus to be above ground level. Focus booms are not produced all along the supersonic flight paths.
- 159: Comment noted. There are many people, as well as international experts, who sometimes make uncritical comments about the effects of noise. This is one case where group opinion is probably better than individual opinion. A group is more likely to consider all aspects of a decision. The EPA and HUD statements and criterion represent the opinion of groups.
- 160: Col Smith's personal comment addressed his recognition of the issue to protect one's backyard from a nonparochial requirement (regardless of the level of impact). He pointed to the fact that some people expressed concern over the endangered peregrine falcon in Reserve, but no such



concern is mentioned when it's suggested to double the impacts in the Valentine MOA which also has a peregrine falcon. (The same point could be made about the many other attributes that are common to the two areas.) It was this point that Col Smith was expressing during the 1979 public hearing.

- 161: The referenced F-15/T-38 beddown document stated the number of F-15 supersonic events (sorties) would be about 1300 per year, which would average about 108 sorties per month. At that rate, there was no question of the White Sands Missile Range's ability to provide the needed support. The requirement now is not 1300 per year as indicated in the comment but 14,400 sorties per year (1200 per month) which does surpass the White Sands Missile Range's long term support capability for the 49 TFW.
- 162: The Air Force does not propose to train at the upper end of the flight envelope in Valentine and Reserve. Functional flights at Mach 2.5+ can and are performed over the White Sands Missile Range. Projected operations for Valentine and Reserve MOA's require external fuel tanks which would have to be dropped during flight in order to achieve the higher flight speeds. This does not degrade the value of distant training areas; pilots must develop conservation habit patterns while employing the aircraft to its optimum configured capability. Although the average supersonic flight speed in Valentine and Reserve would be about Mach 1.1, it will range between 1.0 and 1.4+ Mach and the aircraft would be supersonic about one percent of the time its in the MOA. Supersonic flight will primarily be between Mach 1.0 to 1.1; rarely is air combat maneuvering conducted above Mach 1.2 on a normal mission. Additionally, Carlson's "simplified method" is not restricted to straight and level flight.
- 163: See Paragraph 3.2.3 of the RDEIS.
- 164: The comment grossly overstates the potential impact. The probability, under a most conservative estimate as indicated in the RDEIS, is still no greater than 0.003 that anyone will get focus booms.
- 165: This is precisely why CSEL is used to assess human response instead of peak overpressure.
- 166: Comment noted. While the data is not perfectly gaussian, it does allow for a very conservative statistical analysis. The only assumption of normality is on Page 3-5 and Table 3 where probabilities of various boom strengths are calculated. This assumption overstates the case since the true distribution is skewed to lower values.
- 167: First paragraph is correct but the second is not. Turbulence always decreases boom magnitude, not increasing magnitude due to focusing. Of course rise time and peak impulse are highly significant--hence CSEL. A "focused boom is a focused boom" only as much as a stable, uniform atmosphere permits it to be.
- 168: A focus boom does not move along the flight track like a carpet boom. See paragraph 3.2.3 of the RDEIS.

- 169: If the focus is at high altitude, it can have no effect on people on the ground. See paragraph 3.2.3 of the RDEIS.
- 170: No exception is taken to the "quote"; it does not say the focus always reaches ground.
- 171: Uncritical statements are made repeatedly that people do not adapt to noise or that the startle response has been proven to not adapt after repeated exposure. Such statements are meaningless without stating the parameters existing in the noise environment in which the supposed adaptation or lack of adaptation occurs. The situation is complicated and some parameters are incompletely understood, however, there are occasions where some adaptation does occur. Whether adaptation occurs or not is related to the intensity and frequency content of the noise, the level of the background noise exposure, the expectancy of the stimulation, and etc. Research is continuing in this area and hopefully in the future one can specify in analytical detail those situations where we would and would not expect adaptation. Also, adaptation can occur along many dimensions-- behavioral, physiological, and psychological and we must be able to specify how adaptation occurs along each dimension.
- 172: See response #2.
- 173: The F-15 and T-38 aircraft already use WSMR airspace concurrently as suggested. At the rates which both aircraft currently fly, no more opportunities for co-use are available. Weekend flying at WSMR in the context suggested is not a viable alternative. Additionally, the northern extension of WSMR provides supersonic airspace and is over private lands.
- 174: See 4 August 83 DEEV letter of response.
- 175: See 18 August 83 DEEV letter of response.
- 176: See 19 August 83 DEEV letter of response.
- 177: The information needed to identify claims by a given geographic location such as a MOA is not coded into the Air Force's historical sonic boom claims file. Consequently, the data requested cannot be provided.
- 178: See 19 August 83 Bolt Beranek and Newman letter of response.
- 179: Comment noted. Our review of the literature and experience from supersonic flight in other areas does not indicate sonic booms of the magnitude described in the RDEIS would be a significant environmental impact. See Chapter 3 of the RDEIS.
- 180: See response #179.
- 181: Comment noted. The Oklahoma City study included rural areas in the surrounding countryside.
- 182: There is no evidence to show that humans differ in susceptibility to noises in regard to whether or not the individuals are in a rural or urban setting.

- 183: See response #26.
- 184: In any environment people experience headaches, muscle spasms, etc. The difficulty is in determining what factors contribute to such symptoms or disorders. We can only try to study the problem scientifically and the existing evidence has not established any unequivocal link between noise exposure and any physical disorder except hearing loss. There is no evidence that "stomach problems, muscle spasms..." or any of the other cited conditions have resulted from aircraft operations.
- 185: See response #26.
- 186: Rudosa Hot Springs is map key number 79 on Figure 13 of the RDEIS. The Air Force does not believe there would be a significant effect on recreational/resort activities in the Valentine MOA.
- 187: Neither the proposed action nor the ongoing subsonic flight activities would have measurable effect on climatic conditions in the area.
- 188: It is possible some high overpressure booms could cause cracks in stucco. It must be pointed out that structures react basically as elastic bodies. A sonic boom which acts upon a structure for less than half a second does not generally result in permanent distortion; thus, any cracks quickly open and close and would be less than hairline in thickness. Except in extreme cases, the cracks are microscopic in size. Large visible cracks and spider/crazing cracks are normally the result of settlement and internal stress, respectively. Considering the location of the structure to the maneuvering area, it can safely be stated that the probability of damage to either the stucco or windows would be remote.
- 189: See response #2.
- 190: See response #2.
- 191: See response #148.
- 192: See response #15.
- 193: See response #150.
- 194: See response #151.
- 195: See response #152.
- 196: See response #153.
- 197: See response #154.
- 198: See response #155.
- 199: See response #156.
- 200: See response #155.
- 201: See response #158.

- 202: See response #159.
- 203: See response #160.
- 204: See response #161.
- 205: See response #162.
- 206: See response #163.
- 207: See response #164.
- 208: See response #165.
- 209: See response #166.
- 210: See response #167.
- 211: See response #168.
- 212: See response #169.
- 213: See response #170.
- 214: See response #171.
- 215: See response #172.
- 216: See response #173.
- 217: See response #8.
- 218: See response #9.
- 219: See response #2.
- 220: Comment noted.
- 221: There is no evidence to support the statement that the old and very young are most sensitive to stress from events. All of the evidence to date demonstrates that individuals cannot be stereotyped in this respect.
- 222: Using data which is site specific to the Valentine area (Appendix I) and conservatively assuming linearity, a 26 psf boom would produce a peak ground motion that is between 7 and 11 percent of the Dade County blasting code.
- 223: The Dade County blasting code limits the peak vector sum ground velocities to less than one inch per second at the structure closest to the blasting point which is not owned by the company doing the blasting.
- 224: The Goforth and McDonald study evaluated peak particle velocities of soil. Maximum peak particle velocities were found not to exceed 0.02 inches per second.

- 225: The Goforth and McDonald study was conducted at Edwards AFB, California, Tonto Forest Seismological Observatory near Payson, Arizona, and the Uinta Basin Seismological Observatory near Vernal, Utah. The seismometer locations at Edwards AFB were on a quartz monzonite outcrop and a dry lake bed where the sediments, chiefly clays, were derived from igneous and metamorphic rock. At the Tonto Forest sites, either granite or a thin sandstone and limestone section covered the seismometer array area. The array area at the Uinta Basin site consisted of fluvial, friable, cross-bedded sandstones overlaid locally by thin quaternary terrace deposits.
- 226: See response #20.
- 227: See response #65.
- 228: It is the opinion of the Air Force that there is an adequate data base and no additional studies were needed. Also see response #6.
- 229: See response #30 and #178. The commentor's calculations are wrong.
- 230: The Air Force's confidence in the Oceana methodology has been boosted even more by a recent study of air combat maneuvering operations at other locations. This study shows very favorable correlation between average airspeed, propagating booms per sortie, supersonic events per sortie, and altitude structure for F-15 aircraft. There are differences in the length of time of supersonic events and the spatial spread of the operations. While the Air Force believes these parameters are a factor of the size of the range and available airspace, the resultant noise level is 2 to 4dB less than Oceana. Follow-on studies are planned to further refine this state-of-the-art methodology.
- 231: There has never been any evidence from the studies conducted to date that at the levels forecast for the Valentine MOA, sonic booms will adversely effect the health of senior citizens, young children, persons with heart disease or wildlife.
- 232: The Air Force has conducted an economic impact study and the results are provided in paragraph 3.2.4.2 of the RDEIS. No additional study is planned.
- 233: Reflecting surfaces can cause echos, but the echo is generally of lower sound level than the original sound.
- 234: Commitment to the five mile buffer around Valentine, TX, occurred prior to conducting the Oceana Study which showed operations would generally be localized and not spread throughout the MOA as previously thought. No buffer is needed for either Ruidosa or Candelaria. These towns would not receive many sonic booms because of the Wing's procedures to avoid boundaries by 5NM. The suggested locations for the ellipses are based on optimum terrain characteristics and a commitment to impact as few people as possible.
- 235: See response #20.

- 236: See response #62.
- 237: See response #30. One boom per day of 100 decibels CSEL is 50 decibel average sound level.
- 238: Table 7 of the RDEIS indicates that about five percent of the people within the ellipses would be highly annoyed, with the values ranging from nine percent in the CDNL 58 ellipse, five percent in the CDNL 54 ellipse and one percent in the CDNL 44 ellipse. The statement of 97% of "our residents" are highly annoyed is not relevant since they haven't yet experienced the booms.
- 239: The Tactical Air Command's Division of Environmental Planning does not maintain a file of all reference sources used in preparing environmental impact statements. Since most articles are protected by copyright laws, EIS team members either use their own personal copy or conduct the basic research at local libraries and utilize the services of inter-library loan agreements. The Air Force has cooperated in good faith by providing Air Force generated or funded reports and giving adequate reference information so that the data can be located within the library system.
- 240: The Navy has contracted to have an EIS prepared for supersonic operations. Their EIS will, just as the Valentine EIS, reference the available open literature on health effects.
- 241: The Worthington report was included in Appendix H of the RDEIS. The Air Force reply and Worthington's rebuttal is provided herein.
- 242: See paragraph 3.2.3.2 of the RDEIS and response #8.
- 243: See responses #2.
- 244: See response #39.
- 245: See response #2.
- 246: See responses #65 and 221.
- 247: See response #33.
- 248: See response #40.
- 249: See response #65.

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1. p. 1-17, paragraph 1.8.2: Change 700 to 850; Valentine from 213 to 340; Marfa from 2,647 to 2,466; and Van Horn from 2,240 to 2,772 people.
2. p. 1-21, continuation of paragraph 1.8.4: Change total lots at Green Valley from 256 to 2,560 and total lots at Gulf Coast Development from 300 to 3,000.
3. p. 3-7, Figure 13: Change reference to Table 2 to Table 7.
4. p. 3-17, Table 7: Change 689+ to 850.
5. p. 3-25, paragraph 3.2.4.1: Change 50 miles to 15 miles.
6. p. 3-28, paragraph 3.2.4.2.5: Change second sentence to read: There has been a loss of two eating places in Fort Davis.
7. p. 3-29, paragraph 3.2.4.2.7: Change Route 118 to Route 166.
8. p. 4-7, paragraph (8): Change Valentine population from 213 to 340.
9. p. 4-16, Figure 16: Change 3500 to 440; 150 to 20; and 130 to 75. Delete 110.
10. p. 11-1, reference #4: Change 1973 to 1972.
11. p. 11-3, reference #38: Change Glenn to Gunn.
12. p. 11-6, reference #67: Change to Rand McNally Commercial Atlas and Marketing Guide, 113th ed., 1982.
13. The Worthington Health Effects Report, the AF response and Worthington's rebuttal are provided herein as a continuation of Appendix H.
14. A list of preparers is provided herein as Appendix K.



THE POTENTIAL HEALTH EFFECTS OF SONIC BOOMS  
ON HUMAN POPULATIONS

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September, 1978

THE POTENTIAL HEALTH EFFECTS OF SONIC BOOMS  
ON HUMAN POPULATIONS

This report has been prepared to present a summary of some of the important research completed to date that describes the effects of "noise" on human health. Noise is most often defined as "unwanted sound"; however, it has recently been redefined as "audible sound which is harmful to human health" (Welch, 1971). Health is defined by the World Health Organization as "a state of complete physical, mental and social well being," not merely as "the absence of disease or infirmity."

Sounds take many forms, most of which are not harmful. Variation of sounds is found in frequencies, loudness, and duration. The sonic boom is one form of sound that is best described as being of short duration (perhaps 0.2 second), broad-banded (most of the frequencies are between 50-1,000 cycles per second) and loud (readings can approach 120 decibels). Most of the research completed to date has not been conducted using sounds of the sonic boom type. This is not that important, however, as I will review several important studies that clearly show that loud sounds of whatever frequency within the range of human hearing (approx. 50-20,000 cycles per second) and of whatever duration (short pulsed or continuous) bring on the same general class of effects within the human body. All of the literature that deals with the effects of loud sounds (>90dB) on the bodies of man or experimental animals is relevant. While many of the studies do not prove conclusively that the particular effect occurs in man, they "raise a red flag" that serves to alert responsible persons to the fact that no population should be exposed to the intensity of sonic boom testing proposed by the Air Force for the population in the area of Valentine, Texas, until more research is completed.

SCOPE OF THE PROPOSED TEST.

The Air Force will provide details of the exact scope of the proposed testing in its Environmental Impact Statement. In general, the population of the Valentine area will receive up to 150 sonic booms per day with a "nominal" overpressure of about 2 lbs. per square foot (PSF) for an indefinite period of time (probably for a number of years).

I would like to direct attention to the subject of "nominal overpressures". Nominal overpressures are extremely misleading. In the testimony given by Environmental Specialist Jerome B. Carr, Ph.D., of the Lowell Technological Institute to the Environmental Protection Agency at the Hearings on the Physiological Effects of Sound he pointed out the following:

The important thing to realize is that no matter how low they design this average or nominal value there will always be some high overpressure waves somewhere along any individual flight path, and these overpressure values will be capable of producing physical damage. . . . (Carr, 1971)

What Dr. Carr is saying is that every time a plane flies over, the "nominal" overpressure will be exceeded within a narrow portion of the area affected by the boom. When a given area receives a number of booms, it is a matter of probability as to how many will exceed the nominal level. If only 5% of the booms (one in twenty) fall in the above "nominal" category, then with 100 booms per day five will be above "nominal" and within a zone of higher pressures that could cause damage.

Dr. Carr continued in his testimony before the EPA to raise another point:

Now, there is another thing that the FAA tends to play down and that is the occurrence of what is called superbooms. Superbooms are sonic booms that produce an overpressure value 4 times or up to 4 times as large as nominal value. So, in other words, whenever a supersonic plane maneuvers or turns or changes altitude - does anything like this - it produces a superboom on the ground, a crescent shaped area about one square mile, and the value will lie up here (indicating) clearly within the damage portion of the curve. (Carr, 1971)

It is obvious that if the F-15 is to be tested it will have to turn, change altitude, and maneuver constantly within the test area, and that will affect large areas with high intensity superbooms.

Dr. Carr continued with a point I also want to make:

The fact is that we have voluminary evidence that suggest that the sonic boom will cause physiological damage to the hearing system and because of this research is definitely needed before we can release the supersonic planes for overland flight. (Carr, 1971)

The projected "nominal" overpressures are not likely to cause hearing loss, but superbooms and overpressures that exceed "nominal" (nominal being close to 2 PSF) pose a threat to the health of man in the form of potential hearing loss. Studies in which rodents were exposed to simulated sonic booms have confirmed that ear damage can occur (Majeau-Chargois, et. al., 1970). The remainder of this report will be concerned with other effects on health for which even "nominal" overpressures are dangerous.

#### EQUIVALENCE AND RELEVANCE OF PUBLISHED RESEARCH.

I indicated in the introductory section that the sounds used in the various experimental designs differ in frequencies, intensities, and durations. Jansen has been a leader in investigating the effects of loud noise on man and animals. His own research has involved case studies of humans exposed to continuous loud noise as well as experimental animals exposed to continuous and pulse-type noises of various intensities and durations. In an important review article he summarizes:

. . . it is clear that the relations between high sound levels and their psychophysiological influences are quite unequivocal. There are reactions that may be judged to endanger human well-being and health. It is obvious too, that single events whose intensities exceed established limits are as important as equivalent continuous sound levels. . . . Summarizing, it may be concluded that noise stimuli beyond the critical curve limit for normal vegetative reaction [see below] is 99 dB(A) at maximum, and that between 90 dB(A) and 100 dB(A), a general hazard to human health must be considered. (Jansen, 1973)

It should be pointed out that "nominal" sonic booms have a loudness of at least 105 dB which means that on the log-scale decibel curve the sonic boom is 10 times louder than the threshold for effects on human health that Jansen describes.

The importance of the work by Jansen (1973) is that it equates the single event pulse-type and continuous sound exposures. It means, for example, that case studies of populations of workmen employed in factories where they are exposed to a continuous high level of noise cannot be dismissed as "irrelevant" to a situation in which people are exposed to the loud pulses of sonic booms. Jansen has shown that similarities in the responses of the human body to loud noises of all types exist. While a study of factory workers is probably not exactly equivalent to the possible effects of sonic booms on people, the information can be used as indicative of possible effects since the stress responses of the body involve the same mechanisms (see below).

#### PHYSIOLOGICAL EFFECTS OF SOUND ON MAN

##### ANATOMICAL CONSIDERATION.

Before attempting to describe the effects of sound on man it is important to understand just how vibrations in the air can excite the nervous system of man as well as the endocrine system. I will not attempt to describe the workings of the ear beyond saying that the structures of the ear transform vibrations of the air into the electrical energy of nerve impulses traveling to the brain. The "interpretation" of these impulses by the brain constitutes what we know as sound.

The issue of importance is what happens to the impulses entering the brain that have come from the ears. Many authors have commented on the various pathways the nerve impulse takes within the brain (Welch, 1971; Kryter, 1970).

The interpretation of vibrations in the air (i.e. hearing) is an important part of the survival of man in his environment and is the basis of communication. It is not surprising to find that nerve impulses arriving in the brain from the ears are relayed to many other areas.

It has been generally known for many years that man and other animals exhibit what Selye first described as a "general adaptation syndrome". Any of a variety of stressors including loud sounds can activate this "nonspecific response of the body to any demand made upon it; a stereotyped, phylogenetically old adaptation pattern primarily preparing the organism for physical activity, e.g. fight or flight" (Carlestan, 1973). As Carlestan (1973) and many others have pointed out, the activation of this system is involuntary (i.e. beyond our conscious control), and although adaptive, the repeated activation of this system constitutes a kind of demand on the resources of the body that leads to health problems. Not only is the activation of the system beyond our control, but many studies have proven that an individual cannot habituate (i.e. become adjusted) to the stimuli that trigger the response.

Briefly, the mechanism is one in which impulses from the auditory nerves are routed through the brain stem up to the higher centers (auditory cortex) where interpretation (sound) is registered. These impulses pass through the reticular formation on the way to the higher centers where they play a role in arousal. From the reticular formation they can pass to the hypothalamus where nerve impulses and release of releasing factors can activate the master endocrine gland in the body, the pituitary gland. It is here that disturbances in hormonal levels can occur. Impulses can also be relayed out from the brain over sympathetic nerves from the brain and spinal cord. The responses brought about by the effects of loud sounds (weaker sounds do not excite the system) or other stressors which are beyond our conscious control are called the "vegetative responses". These responses occur even when an individual is asleep

when subjected to a loud sound. Furthermore, as stated above an individual cannot completely adapt to the stressors that stimulate the activation of this automatic sequence of body responses (Welch, 1973).

#### THE VEGETATIVE RESPONSES.

The responses that occur when an individual is subjected to a loud sound (greater than 90 dB; pulsed or continuous) are the following (Jansen, 1973; Rosen, 1970; Dougherty, 1971):

- Dilation of pupils
- Moderate decrease in stroke volume of heart
- Change in heart rate
- Decrease in skin temperature
- Vasoconstriction of peripheral blood vessels
- Inhibition of gastro-intestinal peristaltic activity (i.e. decrease in rate of stomach churning, etc)
- Inhibition of secretion of gastric juices and saliva
- Increase in release of adrenalin and noradrenalin
- Increase in production of steroids
- Increase in cortical blood volume
- Increase in perspiration

This is only a partial list of effects of sudden loud noise on the body. These responses are adaptive as they prepare the body for exceptional activity. Today, however, the need for exceptional muscular activity is greatly reduced and the system is activated much too often which creates imbalances within the body that lead to health problems.

#### HUMAN CASE STUDIES OF THE HEALTH EFFECTS OF CHRONIC NOISE EXPOSURE

Jansen (1973) has shown that similar effects within the body are elicited by loud noise whether it is of a pulse type or of a continuous nature. All of the following studies are relevant in that they clearly indicate that human health deteriorates when individuals are exposed to loud noise for long periods of time (years).

Cohen (1973). Cohen compared 500 factory workers exposed to 95 dB or higher noise for 5 years or longer with 500 factory workers employed in quieter factories and found significant differences in the health records for the following:

respiratory disturbances  
non-specific allergenic disturbances  
musculoskeletal disturbances  
cardiovascular disturbances  
gastrointestinal disturbances

The high noise group had more accidents, absences from work, and health problems.

Sakamoto (1959). This investigator reported that more than 50% of the inhabitants living close to an airport complained of various types of somatic distress.

Mjasnikow (1970); Andriukin (1961); Shatalov, et al. (1962); Ratner (1963).

These case studies of workers from noisy factories revealed an increased incidence of hypertension. Control groups from quiet factories did not show the higher levels.

Jerkova and Kremarova (1965); Anidrukovich (1965); Strakhov (1966); Dumkina (1970). These case studies report increased incidence of "nervous complaints" in workers habitually exposed to high noise levels.

Abey-Wickrama (1969, 1970); Herridge and Low-Beer (1973). These investigators report a correlation between living near an airport in England and an increased number of admissions to psychiatric hospitals. These findings were challenged (Chowns, 1970); however, the Herridge and Low-Beer (1973) study is a follow-up that reports the same trend.

Tarentola, et al. (1968). This investigator reported that 65% of the factory workers he surveyed who were exposed to noise and vibration for many years had gastrointestinal lesions.

Hunter (1971). He observed an increase in physiological responses and a decrease in performance in dyslexic children compared to normal children



in an area near the San Diego Airport. This study indicates that some people are more vulnerable to the effects of noise than others.

Hausmann (1973). In a review of the literature of noise effects on mental health he says "There are signs that a clear relationship between noise and mental health will be found when sufficient interest develops in the communities of mental health workers and those in the fields related to psychophysiology of audition."

EPA (U.S. Environmental Protection Agency) Report to the President and Congress on Noise (1971). The EPA suggests that there is some evidence of higher incidence of cardiovascular disease, equilibrium disorders and ear-nose-and-throat disorders among workers exposed to high levels of noise.

Jansen (1959). This investigator studied 1400 workers from a variety of jobs who received high levels of noise and found significant differences in incidence of altered cardiac responses.

Connell (1972). This investigator studied woodsmen in Sweden who use noisy motor saws. He found that after work their fingers would turn blue, then white. He considered this evidence of vasospastic disease caused when the small vessels in the hands constrict and cut off the blood supply. Vibration clearly is a factor here along with the sound. Sonic booms also produce whole body vibration which interacts with the sound.

Bell (1966). Bell conducted a neurological study of Italian weavers working in a noisy factory. He found their reflexes to be hyperactive. In some cases the workers EEG's showed a diffuse desynchronization similar to that occurring in the psychoneurosis of personality disturbance.

#### THE EXPERIMENTAL EVIDENCE FOR THE EFFECTS OF LOUD SOUNDS ON HEALTH

In this section I will present a summary of the experimental studies that

have recorded the effects I have indicated below. When possible I have indicated the type of experimental animal utilized. This listing of experimental studies is far from complete. The literature is quite extensive and scattered making it difficult to locate. All of these studies have in common the fact that some form of loud sound was utilized in the experimental design.

#### CARDIOVASCULAR CHANGES

<u>Peripheral vasoconstriction</u>	MAN	(Lehman and Tamm, 1956; Jansen, 1964, 1973; Jansen and Rey, 1962; Kryter, 1973)
<u>Increased heart rate</u>	MAN	(Kryter, 1973; Collins and Iampietro, 1973, they used simulated sonic booms)
	HUMAN FETUS	(Bernard and Sontag, 1947)
<u>Heart enlargement</u>	RAT AND RABBIT	(Gerber and Anderson, 1967)
<u>Hypertension</u>	?	(Smirk, 1949)
	RAT	(Rosencrans, <u>et al.</u> , 1966, used other stressors in combination)
	RAT	(Hudak and Bukley, 1961)
CHANGES IN BASAL SKIN RESISTANCE	MAN	(Collins and Iampietro, 1973, they used simulated sonic booms)

#### CHANGES IN HORMONE SECRETION

<u>Increase in adrenalin and nor-adrenalin</u>	MAN	(Levi, 1966; Arguelles, <u>et al.</u> , 1970)
	RAT	(Horio <u>et al.</u> , 1972; Rosencrans, <u>et al.</u> , 1966)
	MICE	(Jensen and Rasmussen, 1970)
<u>Increase in corticosterones</u>	RAT	(Henkin and Knigge, 1963; Rosencrans, <u>et al.</u> , 1966)
<u>Increase in the weights of adrenal glands</u>	RAT	(Sackler, <u>et al.</u> , 1959, 1960; Sackler and Weltman, 1963; Jurtshuk, <u>et al.</u> , 1951; Miline and Kochak, 1952)
	MICE	(Anthony and Ackerman, 1955)
	GUINEAPIG	(Anthony, <u>et al.</u> , 1959)
<u>Decrease in thyroid hormone secretion</u>	GUINEAPIG	(Brown-Grant and Perthes, 1960)
	RABBIT	(Brown-Grant, <u>et al.</u> , 1954; Harris, 1955)

<u>Degenerative changes in the thyroid gland</u>	RAT	(Milne, 1952)
<u>Increase in ACTH secretion</u>	GUINEAPIG	(Brown-Grant and Perthes, 1960)
	RABBIT	(Brown-Grant, <u>et al.</u> , 1954; Harris, 1955; Arvay, 1960)
CHANGES IN WATER AND ELECTROLYTE BALANCE	RAT	(Lockett, 1970; Ogle and Lockett, 1968)
REDUCTION IN STOMACH CONTRACTIONS	MAN	(Smith and Laird, 1930)
BLOOD SUGAR LEVEL CHANGES	?	(Ashbel, 1956)
CHANGES THAT INVOLVE RESISTANCE TO DISEASE		
<u>Leukopenia followed by leukocytosis</u>	MICE RAT	(Jensen and Rasmussen, 1970) (Johns, 1967)
<u>Decrease in thymus weights</u>	RAT	(Sackler, <u>et al.</u> , 1960; Sackler and Weltman, 1963)
<u>Increased incidence of tumor growth</u>	MICE	(Jensen and Rasmussen, 1970)
<u>Interference of inflammatory and interferon responses</u>	MICE	(Jensen and Rasmussen, 1970)
BEHAVIORAL CHANGES		
<u>Changes in EEG's</u>	FETAL GUINEAPIG MAN	(Scibetta and Rosen, 1969) (Strakhov, 1962; Collins and Iampietro, 1973, they used simulated sonic booms)
<u>Interference with normal circadian rhythms</u>	RAT	(Horio, <u>et al.</u> , 1972)
<u>Increase in emotionality</u>	RAT	(Hale, 1953)
<u>Other changes in behavior</u>	RAT	(Sackler and Weltman, 1963; Morra, 1969; Thompson and Sontag, 1956)
EFFECTS ON REPRODUCTION AND DEVELOPMENT		
<u>Abnormal spermatogenesis</u>	RAT	(Milne, 1954)
<u>Decrease in fertility of females</u>	RAT	(Sackler, <u>et al.</u> , 1959; Sackler and Weltman, 1963; Sackler, <u>et al.</u> , 1960; Arvay, 1970)

<u>Infertility</u>	RAT	(Zondek and Tamari, 1964)
<u>Decrease in ovarian and uterus weights</u>	RAT	(Tamari, 1970; Sockler, <u>et al.</u> 1959, 1960; Sockler and Weltman, 1963)
<u>Persistent estrus</u>	RAT AND RABBIT	(Zondek and Tamari, 1960; Hagino, 1968; Tamari, 1970)
<u>Reduced litter size</u>	RAT	(Gerber, 1966)
<u>Smaller fetuses</u>	RAT AND RABBIT RAT	(Gerber and Anderson, 1967) (Ward, <u>et al.</u> , 1970)
<u>Resorption of litters</u>	RAT MICE	(Gerber, 1977) (Ward, <u>et al.</u> , 1970)
<u>Developmental abnormalities</u>	RAT MICE	(Gerber, 1966) (Peters and Strassburg, 1968, more cleft palate; Ward, <u>et al.</u> , 1970, cranial and limb defects)
<u>Catecholamines are teratogenic i. e. cause birth defects</u>	?	(Gerber, 1969)
<u>Release of oxytocin</u>	? RAT	(The Sciences, 1970) (Lockett, 1970, used thunderclaps)

#### A REVIEW OF POSSIBLE EFFECTS ON HUMAN REPRODUCTION AND DEVELOPMENT

In the preceeding section I summarized the literature that pertains to the effects of sound on the reproduction and development of experimental animals. These studies clearly indicate that loud sounds in the environment of these animals in some way become translated into highly disruptive effects on the normal pattern of reproduction and development. These studies also suggest that the normal pattern of reproduction and fetal development in man may also be adversely affected.

Sontag and his associates have produced a series of studies that have proven that the human fetus can hear loud airborne sounds in the last months of

development (Sontag and Wallace, 1935; Bernard and Sontag, 1947; Thompson and Sontag, 1956). Not only is the fetus capable of hearing, but he is also capable of registering a startle response like that of the adult. Other changes in the physiology of the fetus have been monitored in response to loud sounds (Sontag, 1970).

A number of investigators have reported changes in the behavior of experimental animals (rats) that were exposed in the fetal state to loud sounds (Hale, 1953; Thompson and Sontag, 1956; Sockler and Weltman, 1963; Morra, 1969). The behavioral changes observed involved changes in emotionality (increased rates of urination and defecation), decrease in locomotor and bodily activity, and decreased performance in maze-learning ability. In one particularly illuminating study conducted by Sontag (1963, 1970) the statistical relationship between quick movement or activity during the human fetal period (responses such as can be induced by loud sounds) was correlated to patterns of behavior as a young child. He found increased social apprehension among the children that exhibited more activity as a fetus as judged by hesitation to join groups, anxiety in the face of peer aggression, reluctance to enter nursery school car, etc. These studies suggest that should a human fetus be subjected to repeated startle responses by sonic booms their later behavior will be affected.

The work of Gerber (1969) is of special interest in that it suggests that high levels of catecholamines (adrenalin and noradrenalin) are teratogenic (i. e. cause birth defects). Developmental abnormalities in rats and mice exposed to audiogenic stress (loud sounds) have been reported (Gerber, 1966; Peters and Strassburg, 1968; Ward, et al., 1970) and include an increased incidence of cleft palate as well as other cranial and limb defects. The level of circulating catecholamines in humans exposed to sonic booms will be higher than normal and will remain high as long as the testing is conducted as the body

response that releases these substances never completely habituates to the continuous presence of the stressor. This risk to human fetal development is completely unknown.

The work of Lockett (1970) is of great interest in that he reports the release of oxytocin in rats exposed to thunderclaps. The thunderclap is similar to a sonic boom in being a pulsed sound but differs in being of longer duration and in having most of the energy in lower frequency ranges. Oxytocin is the hormone that is involved in the initiation of the birth process as it stimulates uterine contractions and it also plays a role in lactation. What is not presently known is whether sonic booms will cause the release of oxytocin in the human pregnant female. If it does, the risk of a miscarriage is greatly enhanced.

A final study will be referenced here as it pertains to normal human growth, development, and reproduction. Bennholdt-Thomsen (1938) described "urbanization trauma" or "civilization damage" which pertains to the accelerated and increased life-rhythm accompanying city-life. He compared the onset of menses in young girls raised in the city environment with that for young girls raised in quiet rural areas. He found that menses started earlier in girls raised in the city. He also found that it started earlier in young girls pursuing intellectual professions as opposed to those not pursuing such professions. He found these trends were also correlated with increased population density. He reported that with increase in density the average newborn weights were greater as well as average heights. He attributed this to increase in stimulation in the denser city environment where individuals received more stimuli in the form of noise, light, social contact, etc. He postulated that these stimuli led to the changes in life-rhythms that he observed. Some authorities have explained some of these trends with other hypotheses such as dietary changes. Neverthe-

less, the increased stimulation of individuals living in urban environments appears to be a reasonable hypothesis to explain the early appearance of first menses. Substantiating work has come from other investigators who have reported that audiogenic stress disrupts the normal biorhythms of experimental animals (Zondek and Tamari, 1960; Hagino, 1968; Tamari, 1970; Horio, et al., 1972). The role of loud sound in affecting more subtle changes in human biorhythms is still unknown.

#### SUMMARY

Loud sounds (>90dB) within the range of human hearing whether they are pulsed or continuous activate the sympathetic part of the autonomic nervous system. The activation of this system is adaptive in that it prepares the body for exceptional activity. The responses of the body to sympathetic stimulation involve almost every system and part of the body and include changes in blood flow, heart action, blood sugar levels, fluid and electrolyte balance, hormone levels, etc. Health problems are created in some individuals when this system is repeatedly stimulated. Complete habituation to persistent stimuli never takes place in anyone.

The available evidence is now of such a magnitude that the only conclusion that can be drawn is that the health of some individuals will be adversely affected should sonic boom testing be conducted over the population of Valentine, Texas and vicinity. It is not possible to predict what the specific effects on a given individual might be or even what proportion of the population will experience adverse reactions. Some of the possible effects that cannot be dismissed on the basis of current knowledge are especially frightening. These include the potential effects on the fetus such as birth defects, miscarriage, and changes in normal child behavior. Other possible effects on all people include

loss of hearing, effects on mental health, effects on the circulatory system such as hypertension, digestive system problems, etc. In view of the current knowledge of the adverse effects of loud sounds on health it is morally and ethically wrong for a governmental agency knowingly to subject a human population to this form of increased stress. The testing of the F-15 fighter plane should not be conducted over any populated area.



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REPLY TO  
ATTN OF BBA

6 February 1979

SUBJECT Evaluation of Sonic Boom Health Effects Report

TO TAC/DEEV (Wm A. Duffy)  
Langley AFB VA 23665

1. The report on "The Potential Health Effects of Sonic Booms on Human Populations" by Richard D. Worthington that was submitted to our office with your 10 January letter request has been reviewed. Lt Col Dan Johnson was asked to review the report and provide comments to me for incorporation into our response to TAC/DEEV. His review and comments, directed to the Worthington report and the question of physiological effects of noise, are so thoroughly treated that his comments are being forward to you as our response to your request (atch 1).

2. The general situation of sonic boom exposures of the human population has not changed markedly over the years. Whenever sonic booms occur over populated areas some complaints to the responsible party are expected. In addition, damage to window glass, plaster, and the like as well as possible breakage of bric-a-brac type items will occur. The tolerance of the exposed population to these events will be influenced by the extent and nature of the public information about the booms prior to and during the program. The manner in which any damage to property by the booms is recognized and equitably compensated in an expedient way is likewise very important. Delayed investigations of minor claims, large amounts of documentation required from the damaged party and slow responses to remedy the situation and make compensation are believed to be major contributors to reduced tolerance of sonic booms. Negative reaction and more widespread damage to property may be expected to increase with significant growth in the intensity and/or frequency of sonic booms.

3. The receptor most sensitive to impulse noise in man is the human auditory mechanism, and especially the eardrum membrane. Rupture of the eardrum membrane has occurred in response to intense impulsive sounds such as heavy weapons fire, explosions and blasting, and the like, however there is no confirmed instance known to us of human eardrum rupture caused by sonic boom. As mentioned by Lt Col Johnson, this includes some of our own personnel who have experienced several sonic booms at levels of 100 to 144 pounds per square foot with no discomfort or adverse effect on their hearing mechanisms. In spite of the extensive literature cited and interpreted by Dr. Worthington and in view of the rather extensive experience of the USAF, NASA and the FAA during the

National Supersonic Transport Program, there is no evidence known to us of direct physiological injury due to exposure to sonic booms. Indirect injury has been reported to result from individuals struck by objects falling due to the sonic boom, and the like, and the possibility of this type of injury does exist.

4. To be scientifically objective, it must be recognized that whether sonic booms (and loud noise) produce adverse health effects on man involving his cardiovascular system, endocrine system, hypertension and the like, is still an open question. These "indirect" effects in humans can be activated by so many different stimulus factors (both external and internal to the individual), including basic emotions, that it has not been possible to establish unambiguous causal relationships between the various noises and their purported effects.

5. It is hoped that this information is useful to you. If there are questions please contact Lt Col Johnson or the undersigned at autovon 785-4244/3607.

*Charles W. Nixon*

CHARLES W. NIXON, Ph.D.  
Chief, Biological Acoustics Branch  
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3 Atchs

1. Sonic Boom Comments
2. Guidelines for Preparing  
EIS on Noise
3. Report #550/9-74-U04

COMMENTS ON "THE POTENTIAL HEALTH EFFECTS OF SONIC BOOMS ON HUMAN POPULATIONS" BY R. WORTHINGTON

1. General: This is a rather difficult paper on which to comment. In some areas the author is clearly wrong and specific comments to this effect are given below. On the one hand he overstates some of the effects of sonic booms in some cases and on the other, he ignores hard quantifiable effects of sonic booms that are known. In some parts of his paper he makes statements that are difficult to dispute. He discusses some nonauditory effects of sound that do occur. The difficulty arises in assessing the importance of such effects on humans and their health. As Dr. Worthington clearly shows, there are numerous reports that claim rather dire effects from noise. How reasonable these claims are has been summarized by others such as Dr. Kryter and Dr. Cohen.<sup>2</sup> The state of the art may be best summarized in the EPA Criteria Document on Noise.<sup>3</sup> Its conclusion on nonauditory noise states

"Noise can elicit many different physiological responses. However, no clear evidence exists indicating that the continued activation of these responses leads to irreversible changes and permanent health effects. Sound of sufficient intensity can cause pain to the auditory systems. Except for those persons with poorly designed hearing aids, such intense exposures should not normally be encountered in the nonoccupational environment. Noise can also effect the equilibrium of man, but the scarce data available indicates that the intensities required must be quite high or similar to the intensities that produce pain."

The most recent assessment of the current state of knowledge and its use in this field is contained in the Second Edition, Handbook of Noise Control (1979) in the introductory paragraph of a chapter on Physiological Effects of Noise by Dr. William Burns, Emeritus Professor of Physiology, Charing Cross Hospital Medical School, University of London, England.

#### Introduction

This chapter discusses the physiological reactions of the human body to noise; the effects on the hearing mechanism and psychological effects are described in Chaps. 3 and 16, respectively. Knowledge in this field has not kept pace with advances in knowledge of the relation between noise and hearing. Studies of physiological effects contain difficulties of observation and interpretation. Where human laboratory studies are used, projection to real life situations may be misleading. Studies on lower mammals may be complicated by significant species differences compared with humans; and the

effects of magnitude of the stimulus in animal experiments, compared with that conceivably sustained in real life in human exposure, must be considered. In field studies of real human situations, adequately controlled conditions may be unattainable, so that results deriving from some other factor in the total environment of the subjects may be incorrectly attributed to noise. All of these considerations enjoin caution in the acceptance of conclusions of any study in this field.

While this does not say that there will not be any problems with noise exposure, it does indicate that in spite of the extensive literature conclusive cause and effects relationships of noise have not been established and that hearing is still probably the most sensitive indicator of physiological damage. So part of the problem of assessing the effects of sonic booms in the Valentine area is to explore the expected impact of sonic booms on hearing. Fortunately, as will be shown in the specific comments later on, the effect of sonic booms on hearing is expected to be completely negligible.

## 2. Specific Comments:

a. Worthington states that sonic booms are broad banded (most frequencies are between 50-1000 cycles per second) and loud (readings can approach 120 decibels). This is one indication that Dr. Worthington is somewhat off the mark. First, while it is true that sonic booms are broad banded, most of the energy lies in the 20 Hz to 100 Hz range. This is important because as will be mentioned in a later comment, these frequencies do not directly affect humans as much as they affect houses in which humans live. These low frequencies couple into the structure of a house and will cause "house rattles." These low frequencies also mean that the A-weighted level, or dBA, will be considerable less. In fact a sonic boom with an unweighted peak level of 120 dB will have an A-weighted sound exposure level of 78 to 85 dB. A standard sound level meter on slow response would read somewhere between 75 to 82 dB for this boom of 120 decibel peak. Note that these levels are even below the A-weighted level of 99 dB quoted by Jansen 1973, (see bottom of page II of Worthington's paper). This again emphasizes that the non-auditory effects of the sonic booms should not be considered a problem. Numerous activities and events, such as shutting car doors, shouts, loud talking, barking dogs, etc., will cause similar A-weighted levels and are certainly expected to be as important as the direct audible effects of the sonic booms, even those 10 decibels to 15 decibels or so higher. This is of some importance since the peak pressures of nominal booms will range from 115 dB (about .25 psf) to 133 dB (approx 2 psf). The 120 dB that Worthington cites is probably slightly low. This leads into the next comment.



b. Worthington states that up to 150 sonic booms will occur per day with a nominal overpressure of about 2 lbs per square foot (PSF). First, it should be emphasized that 150 booms per day is too high an estimate of what any one location on the ground will receive. Personnel from our laboratory have visited areas that have similar activities to what is expected for the Valentine area. In such areas only 1 or 2 sonic booms per day were perceived. Discussions with the residents of the area verified that this was a reasonable average. Yet the aircraft were predicted to have gone supersonic far more often. The inconsistency, of course, comes from the fact that when an aircraft goes supersonic in a large area, only part of that area may be impacted by a sonic boom. The amount of area impacted depends somewhat on altitude, but mostly on the time the aircraft stays supersonic and the kind of maneuvering involved. For instance, a single sustained supersonic level flight could impact a far greater land area than 100 short time supersonic bursts of speed - even assuming each supersonic burst covers a different geographic area. In summary, it is important that the effects of sonic booms be assessed by predicting, or measuring, the expected number of booms per day that will be received by any one individual or any one land area. This average number of booms should be roughly predicted in the Impact Statement. However, we would be surprised if on the average more than a few booms a day occurred at any one location.

c. Worthington quotes Carr about the problem of superbooms.

It is quite true that the type of maneuvering expected in the Valentine area will cause some focusing of the sonic booms. However, two considerations should be kept in mind. First, the greatest peak pressure of a sonic boom from level flight is directly beneath the aircraft. The sonic boom pressure decreases as the lateral distance from the aircraft increases. Since the predicted nominal boom is that boom right under the aircraft, only those areas directly under the aircraft will receive the nominal boom. The expected peak pressure can be increased by as much as a factor of four, but when this happens it is more often than not an amplification of a boom that is less than the nominal boom. The focusing of a sonic boom from a supersonic turn is a good example. The second consideration is that generally the more the boom is amplified, the less area will be affected. Thus the greater the superboom the less likely such a boom will occur at any one land area.

Again referring to our experience with similar areas, perhaps only one or two superbooms will occur per year at any one location. These few booms, nevertheless, will result in one of the two clearly identifiable impacts that will occur from supersonic flight in the Valentine area (the other impact, annoyance from house rattles, will be discussed later). It is reasonably certain that on occasion some windows will be broken and some plaster or drywall cracks will occur. Major structural damage is very unlikely to occur, but minor damage cannot ever be ruled out.

Speaking only as an individual, if I were living in the Valentine area, I could easily accept the proposed supersonic overflights provided if a window is broken, I could get it replaced without a hassle. By no hassle, I mean that I can make one call and get the first commercially available service to replace the window. If I would have to file a written claim and wait until an investigator saw the window, this would be unacceptable. In other words, if the Air Force is not reasonable in how they handle minor damage to structures, then I would campaign vigorously to prevent them using the area in which I lived for supersonic maneuvers.

The comment was made that superbooms are liable to cause hearing loss. This is clearly wrong for occasional superbooms of even 40 psf, much, less superbooms from 4 psf to possibly 10 psf that are likely to occur in the subject area. People from our laboratory have been exposed to sonic booms as high as 144 psf without adverse effects.<sup>9</sup> Research on 100 subjects exposed to rapid air bag inflations that were accompanied by intense impulse (which are reasonably similar to sonic booms) showed only a very small amount of temporary change in hearing that quickly recovered. Subjects exposed to simulated air bag noises at peak levels as high as 166 dB (80 psf) showed that small temporary changes in hearing were mainly caused by the high frequency noise and not the low frequencies as found in sonic booms. Even use of the CHABA criteria for impulse noise, which doesn't consider the ameliorating fact that the sonic boom is largely composed of low frequency energy, would allow one boom per day at 152 dB (16 psf). In essence, we are sure that even the occasional superboom expected for the Valentine area is safe with respect to hearing damage.

c. Worthington cites numerous research articles which indicate the Physiological Effects of Sound On Man. This is an area that has been debated for many years and will probably never be resolved to everyone's satisfaction. Kryter has recently made detailed and objective surveys of the literature and it is appropriate to state the conclusions. In work supported by the U.S. EPA, Kryter concludes:

In spite of the very large gaps in our knowledge and the existence of some apparently conflicting research results, the following conclusions are put forth, with, of course, the usual admonition that more research is needed before they can be accepted with great confidence.

1. There is no likely damage risk to a person from the possible unconditioned stress responses to noise that are mediated by the autonomic system.

2. Noise may often be concomitant with danger and adverse social-environmental factors that are more important than the noise itself as a cause of apparent greater incidences of various physical and psychological disease and accidents in industry.

3. Autonomic system stress responses could conceivably be a contributing factor to ill health in some persons as the result of noise in their living environment directly interfering with auditory communications and sleep, and, thereby, creating the feelings of annoyance and anger that serve as the direct cause of the stress responses.

4. It would appear that controlling meaningless noise to levels that permit auditory communication and sleep behavior adequate for a given work or living environment would obviate that occurrence of any extraauditory responses in the body of a stressful nature.

The problem, as I see it, with most non-auditory research, is that clear cause and effect relationships have not been found. For instance, there are some studies that have shown that blood pressure of workers in noisy industries are higher than the blood pressures in the general populations. What such studies have not shown is that the noise is the cause of the high blood pressure. The high blood pressure could just as well be due to vibration, dust, the danger of moving machinery, etc., or some combination of these. The problem is that noise is a by-product of those kinds of jobs that probably do cause more stress. With respect to noise induced hearing loss, we know by experience that one extremely loud noise can cause a permanent change in hearing ability. We can further verify such changes in animals by looking at damaged hair cells of the inner ear. We have no similar data for blood pressure. Thus we can only make a conjecture that there might be a cause and effect relation. Such a relation could be shown if we could find two groups of people identical in all ways except for noise exposure. Unfortunately, such a situation has not been found. Until such proof is forthcoming, such possible effects must be ignored in the planning or decision making process. If we do not ignore these conjectures, then the question is not whether or not a few sonic booms in the Valentine area are a problem, but the question is should we have an industrialized civilization at all. We know enough about typical noise doses of Americans to realize that a few sonic booms would be only a very small contribution to the average person's total noise exposure. (See for instance, Schori, 1978).<sup>12</sup>

With this in mind, let us use the only knowledge of sonic booms that can be quantified. It is known that the number of people who report that they are highly annoyed does increase with increased sound pressure level of the booms. A study was conducted in Oklahoma City in which 8 booms per day occurred every day for a period of six months.<sup>13</sup> Different peak levels were used during different times and the population was also questioned at different times. It is clear that exposure to sonic booms can reach an unacceptable level. The residents were asked a variety of questions concerning why they were annoyed. In virtually every case, if they were annoyed by sleep disturbance, startle, speech interference, etc., they also reported that they were annoyed by "house rattles." Thus, "house rattles" appears to be the most sensitive effect of sonic booms. Further discussion of this effect can be found in such reports as those by Schomer.<sup>14</sup> Recent guidelines for such high energy impulses have been provided to the EPA by a National Research Council Committee on Hearing, Bioacoustics and Biomechanics (CHABA).<sup>15</sup> Pertinent parts of these guidelines are attached. If for planning purposes the impact of the sonic booms is to be kept equivalent to a general noise exposure of an  $L_{dn}$  of 65 dB, 8 booms per day greater

than 2 psf would be unacceptable. Other unacceptable exposures to residential dwellers would be 16 booms at 1.4 psf or 4 booms at 2.8 psf. By converting the peak pressures to C-weighted Sound Exposure Levels, combinations of sonic booms at different levels can be assessed. Observation of these guidelines will insure that the Valentine area will be impacted no worse than any other area impacted with a new noise source. Besides the DOD, HUD also is planning to use a limit for new housing of an  $L_{dn}$  of 65 dB.<sup>16</sup>

From our visit to other areas, it is believed that this limit will be met since the operations between different MOA's are similar. A more detailed assessment should be included in the EIS.

### 3. Conclusions:

Prof Worthington shows concern about the sonic boom exposure expected in the Valentine area. We agree that there is some basis for concern, but not for the reasons stated. Occasionally light damage from booms can be expected to occur. Annoyance, largely due to house rattles, will occur. This annoyance can be quantified and an acceptable exposure defined. This should be done.



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RESPONSE TO DR. CHARLES W. NIXON AND LT. COL. DANIEL L. JOHNSON'S  
CRITIQUES OF "POTENTIAL HEALTH EFFECTS OF SONIC BOOMS  
ON HUMAN POPULATIONS" BY RICHARD D. WORTHINGTON

The central thesis of my report on the potential health effects of sonic booms is that this type of loud impulse noise constitutes a stressor that will lead to the deterioration of the health of some individuals that are exposed for a period of years. Nothing in the critiques of my report by Dr. C. W. Nixon and Lt. Col. D. L. Johnson can disprove that contention. In fact, the volume of information on adverse effects of loud noise on human health is now so extensive that the stand taken by Nixon and Johnson represents "the clutching at straws." Clearly, the Air Force is not willing to take responsibility for the health and welfare of individuals in the proposed operations areas for to acknowledge that human health might be affected is to open a "can of worms" in terms of the legal ramifications that are involved.

In the following paragraphs I will address some of the questions that Nixon and Johnson raised concerning my report. In a few cases I was wrong, but most of their own comments are inaccurate or misleading.

CRITIQUE BY DR. C. W. NIXON

Section 1 is a historical statement of no relevance to the content of my report. Section 2 concerns property damage which I did not address.

Section 3. Concerning the possible loss of hearing from exposure to sonic booms I would have to say that I agree with Dr. Nixon (and Lt. Col. Johnson) in that the literature (available data) does not indicate that sonic booms are likely to cause hearing loss. If I had found solid evidence, I would have presented it. I do not believe that the final word is in, however. I did find

one study which reports that sonic booms cause hair cell damage in rodents (direct physiological damage). I raised concern in my health effects report only about focus booms (super booms) having the potential to damage hair cells. The accepted exposure limits to continuous noise of the intensity of the focus booms that could occur with some regularity in the proposed operations areas are measured in seconds. I do not agree with the contention (he references no study to back up his claim) of Johnson that only a few focus booms will be heard by an individual in the area in the course of a year for reasons that I will elaborate upon below. However, using the phrase in Dr. Nixon's report "to be scientifically objective," the effects, if any, of continuous exposure (for years) to periodic focus booms on human hearing is not known.

#### Section 4.

To be scientifically objective, it must be recognized that whether sonic booms (and loud noise) produce adverse health effects on man involving his cardiovascular system, endocrine system, hypertension and the like, is still an open question. These 'indirect' effects in humans can be activated by so many different stimulus factors (both external and internal to the individual), including basic emotions, that it has not been possible to establish unambiguous causal relationships between the various noises and their purported effects.

I would urge all readers of this report to study this paragraph from Dr. Nixon's report to try and determine just what he is saying. Is he saying that although some researchers have shown a link between loud noise and adverse health effects, until that relationship is firmly proven and unambiguous to all concerned, the Air Force will continue to expose unwilling people to loud noise and assume no responsibility for the consequences? Is he not also saying that because the same physiological mechanisms are activated by many factors including emotions that it is all right to add sonic booms? What exactly is Dr. Nixon saying?

I submit that Dr. Nixon is clearly aware of the many studies that indicate



loud noise causes adverse health effects through repeated activation of the stress response. I also submit that he is "clutching at straws" to keep from admitting that the causal mechanisms have already been shown to be clear and unambiguous. Perhaps the courts will have to decide when results are "unambiguous." I believe that the case can be made now.

#### RESPONSE TO LT. COL. JOHNSON

Section 1. I would like to focus on the first quotation referenced by Johnson. Most of the quotation is irrelevant but the first two sentences could be misleading to the untrained.

Noise can elicit many different physiological responses.  
However, no clear evidence exists indicating that continued activation of these responses leads to irreversible changes and permanent health effects.

Please note the words "irreversible" and "permanent" in the quotation. If hypertension results from continuous exposure to loud noise (such has been demonstrated in humans and experimental animals!) that would not be counted in the above quotation because it need not be "permanent" as it can be successfully treated (i.e. reversed). If an individual develops gastrointestinal lesions from exposure to loud noise as has been demonstrated in workers in certain industries, it would also not count as a "permanent" and "irreversible" health effect. Hypertension is a non-permanent (potentially at least) and reversible health problem that causes large numbers of deaths in this country each year. I submit that the first quotation submitted by Johnson is irrelevant to the thesis I have advanced in my health effects report. I also challenge the contention that irreversible and permanent health damage does not occur with exposure to loud noise. The evidence is presented in my health effects paper in connection with the reproduction and later behavior of laboratory animals. This literature is completely overlooked in the noise effects surveys

I have seen. Birth defects, miscarriages (through release of oxytocin), and behavioral disturbances are likely to be permanent and irreversible!

The second quotation, that from Dr. Burns, is correct. I agree that "caution" must be used in accepting conclusions from research studies concerning effects of noise exposure on human and animal health. In view of the many studies we presently have that indicate adverse health effects from continuous exposure, what about exercising the same caution in regards to exposing individuals in the future? It is possible to pick on almost any study and say that such and such was not adequately controlled. However, we have an added consideration here. Many studies have now been completed that show that man is adversely affected by exposure to loud noise for long periods of time. These studies cut across different industries, cultures, and environments, but all have in common the exposure of individuals to loud noise. Many of the studies have been carefully controlled. The common thread is loud noise. One can clutch at straws and say "to be scientifically objective" something is wrong with each study. This is clearly an unreasonable approach. To add one more bit of recent evidence to the controversy, I cite a recent summary article from Parade (Dec. 2, 1979):

Noise and blood pressure. Continued exposure to loud noise not only impairs hearing, it can also raise blood pressure. So contends the Federal Health Agency of West Berlin, whose findings are being studied by the World Health Organization.

Research scientists in West Berlin monitored workers in a bottling plant where the average noise decibel level was 95. After several days of wearing ear covers, their blood pressures went down. Once the ear covers were removed, their blood pressures rose.

According to the study, continued exposure to high noise levels can cause not only high blood pressure but eventually some heart damage.

This type of controlled study completely takes the rug out from under the authorities Nixon and Johnson reference with their contentions that other environmental factors have not been controlled and screened out. In

this study the workers continued to work in the same environment. Noise exposure was controlled by wearing ear covers. It is clear that the noise was the factor responsible for the elevation of blood pressure.

I might point out that I have already referenced in my health effects report the studies that have shown that impulse noise is just as bad as continuous noise in causing the responses that impair health. I will also point out that the sonic booms projected for the operations areas are many times louder than the 95db background noise in the factory in West Germany.

The final remarks in Section 1 regarding hearing as the most sensitive indicator of physiological damage is misleading and simply not true. Chronic auditory stress is the most important health consideration.

Section 2, Specific Comments, A. I was completely aware of the energy distribution of sonic booms when I wrote my report and I can see here that Johnson is guessing that the threshold levels established by Jansen for initiating the physiological responses might not be exceeded by the nominal sonic booms that would be experienced in the operations areas. This question can be resolved by simply asking if any studies show that sonic booms initiate a true startle response? If such is the case, then the physiological mechanisms would be activated that would cause the stress responses that could lead to the deterioration of health with long-term exposure.

In an important FAA sanctioned study by Thackray, Rylander, and Touchstone (1973, FAA-AM-73-11) it was clearly established that sonic booms trigger a true startle response in female subjects. They estimated that outdoor booms of about  $50\text{N/m}^2$  (= about 1 PSF) was close to the threshold for producing startle responses in some of the subjects inside the frame test building. They also found that a marked jump in the percentage of individuals experiencing startle effects occurs when the overpressures reach  $150\text{-}180\text{N/m}^2$  outdoors (only

40-46N/m<sup>2</sup> inside the frame test building). They did not determine what levels outside would initiate startle responses in individuals who were exposed outside or what the threshold levels might be for males. They also reported that no habituation was possible to the louder booms. I have two or three other references that I can supply on request that have shown no habituation is possible to sonic booms.

Section 2, B. I must admit that I am partly in error in regards to the scope of the proposed testing; however, Johnson's estimates are almost certainly in error and are not supported by factual surveys. He predicts that an individual will experience no more than a few booms per day. Now that I know the exact scope of the proposed testing I predict that some individuals will hear 20-40 booms per day on some days with an average of close to 15. If the use in either proposed area is doubled, the average will double. Who is correct?

In order to determine the exposure level one must know several parameters and then conduct an appropriate survey. First, one must know the distribution of the population in the operations area. Second, one would need a saturation map showing the density of booms as a function of surface area as an operations area would not be uniformly utilized. With these two facts one could then design a sampling procedure and analysis that would provide a true picture of what individuals are experiencing. Johnson has given us his opinion that some people will hear an average of two booms per day, but it is possible that others living near the areas of greatest use within the operations areas will hear most of the booms every day. In the absence of a valid survey, the potential exposure of some people to every boom generated must be considered. If this project is approved, then the exposure of individuals to 40 booms/day or 80/day, if the use were to be doubled in either area, would be within the proposal limits. We know very little about annoyance from such saturation booming as the Oklahoma City test only subjected individuals to about eight per day. I will elaborate

on this point below.

Section 2, C (pp. 3-4). Regarding the frequency of focus booms I can only say that I completely disagree with the estimates given by Johnson for the same reason outlined above.

Section 2, C (pp. 4-5). In this section Johnson quotes conclusions drawn by Kryter. These conclusions deserve comment.

Kryter clearly acknowledges that a stress response does occur in the human in response to loud noise (point 3). He does not appear to be aware of studies that contradict some of his conclusions. For example, his conclusion that "there is no likely damage risk to a person from possible unconditioned stress response to noise" is certainly challenged (but not yet positively refuted) by studies that have shown that the high levels of circulating catecholamines released during stress can cause birth defects in experimental animals and by many other studies that have demonstrated disruption of normal gestation in rats subjected to stress. Should any of these effects also occur in humans I would consider that to be damage from the stress response. I might add that the recent study from West Germany has linked the high blood pressure caused by exposure to factory noise to heart damage.

Kryter's second point that environmental factors associated with noise might be more important than the noise itself causing physical and psychological disease is true in some cases but is not the best explanation for the variety of studies we have today. Studies such as the West Germany study referenced above and other controlled studies I have reviewed in my health effects report show that it is the noise that is causing the deterioration of health in some exposed individuals.

In Kryter's third point he acknowledges that "autonomic system stress responses could conceivably be a contributing factor to ill health in some persons as a result of noise in their living environment . . . ." He tries to

equates this with disruption of communication and sleep which further aggravates the condition. I do not think that anyone will deny that well-rested people can better handle stress, but all of the studies of workers from noisy industries deal with people who presumably go home to quieter home environments after work. I suspect that Kryter is thinking in terms of those studies that concern populations living within noisy environments, such as those who live near airports. In those cases I can see that he has a point as rest would be disturbed, but the many studies concerning exposure to loud noise at work do not support his conclusion.

Johnson's comments in the first paragraph of page five again raise the issue of demonstrating clear cause and effect relationships between exposure to loud noise and health problems. He demonstrates here that he is not familiar with the literature (see my health effects report for references). In the case of blood pressure, for example, blood pressure changes have been monitored in humans in the laboratory in response to loud noise. We also know what intensity of noise is required to produce the automatic and involuntary increase in blood pressure. Studies have shown that individuals working in noisy factories have elevated blood pressures compared to individuals working in quieter factories. Now it has recently been shown that individuals who start wearing ear protectors to reduce the perceived noise experience a reduction in blood pressure while they are still at work in the same environment with the same machines, dust, vibrations, anxieties, and whatever. The issue is now very clear and the attempts by Johnson and the Air Force to play down these studies is not justified.

In the last paragraph on page five Johnson raises the issue of annoyance. This subject was not covered in my health effects paper, but I will make some comments on this problem. Johnson tries to play up the importance of "house rattle" as the most sensitive effect of sonic booms. I have already cited a study that has confirmed that many people experience a true startle response to

sonic booms. Every human being who can read this report has been startled at one time or another. This is always a very unpleasant and truly annoying experience. The issue is not about the few people who elected to equate the annoyance to "house rattle" which is something that perhaps they better understood among the few choices on the questionnaires rather than the true physiological response to being startled. There is absolutely no question about the fact that sonic booms are annoying to many individuals because they startle those individuals. There is also the fact that many individuals in the Oklahoma City survey found the experience completely unacceptable.

As for guidelines to reduce the annoyance, one can refer to a number of documents that have something to say. It is important to realize, however, that the Air Force has not conducted the proper studies that will adequately describe the impact of the proposed project on the human population. The opinions of Johnson are not adequate. I have indicated in a previous section what would be required to demonstrate impact. Anything less than that would be inadequate. We must assume that some individuals will hear every boom (full proposed impact) until the Air Force conducts the appropriate unbiased surveys in some operations area.

In the EPA report "Information on levels of environmental noise requisite to protect public health and welfare with an adequate margin of safety" (1974) it was concluded:

Thus, the peak over-pressure of a sonic boom that occurs during the day should be no more than 35.91 pascals if the population is not to be annoyed or the general health and welfare adversely affected. (Note: 1 PSF=47.88 pascals).

This document also points out that for eight booms per day the level should be less than 12.45 pascals.

In another important study by B. O. Lundberg (1969), "Acceptable nominal sonic boom overpressures in SST operation," IN: Proceedings of the conference,





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